ENVIRONMENTAL ASSESSMENT BOARD

Ontario

ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 151

DATE: Tuesday, May 26, 1992

BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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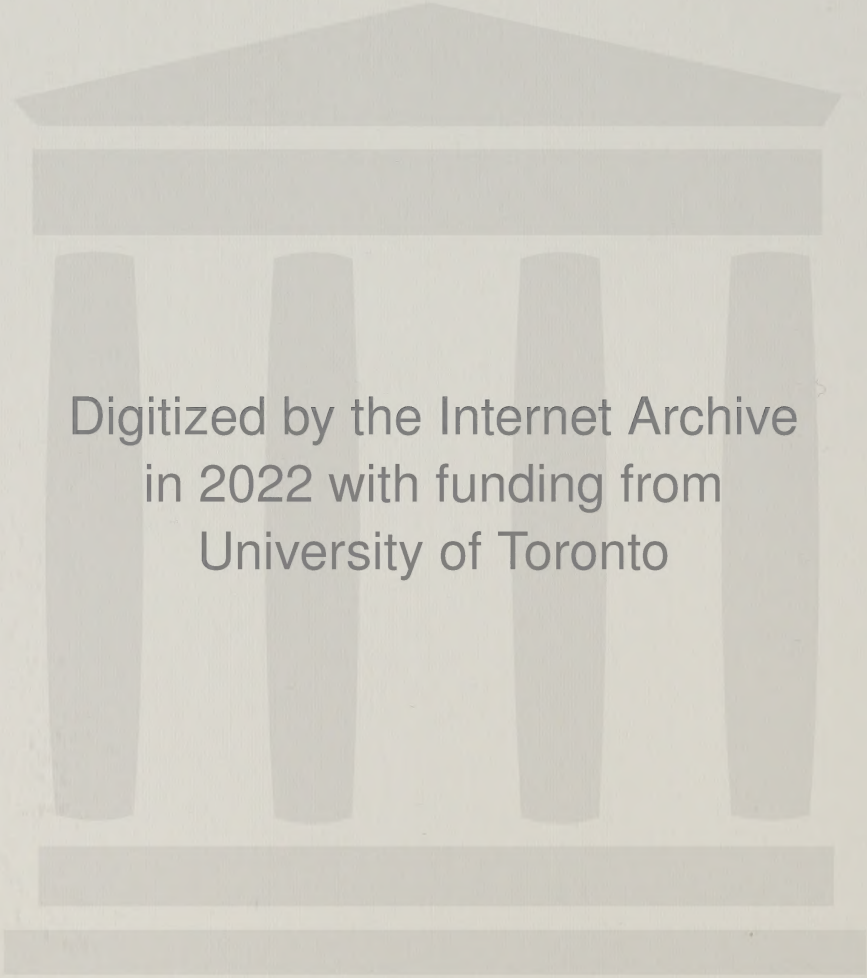

ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act, R.S.O. 1980, c. 140, as amended, and Regulations thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro consisting of a program in respect of activities associated with meeting future electricity requirements in Ontario.

Held on the 5th Floor, 2200 Yonge Street, Toronto, Ontario, Tuesday, the 26th day of May, 1992, commencing at 10:00 a.m.

VOLUME 151

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THE REGISTRAR: Please come to order. This hearing is now in session. Be seated, please.

THE CHAIRMAN: I suppose we should observe that yesterday we passed the milestone 150, 150 days, which is a number that has been bandied around in our process. It took roughly 13 months of fairly diligent work to accomplish 150 days of hearing.

Mr. Mark?

MR. MARK: Thank you, Mr. Chairman. Just for your information, to help those who are concerned about the schedule, Mr. Chairman. I expect I will be until late this morning. Mr. Watson will follow me with some other issues on behalf of the MEA. I expect he will be at least the day, perhaps somewhat into tomorrow. That seems to be our best estimate at present.

THE CHAIRMAN: Thank you.

AMIR SHALABY,
JOHN KENNETH SNELSON,
JANE BERNICE TENNYSON,
FREDERICK GEORGE LONG,
BRIAN PAUL WILLIAM DALZIEL,
HELEN ANNE HOWES; Resumed.

CROSS-EXAMINATION BY MR. MARK (Cont'd):

Q. Mr. Dalziel, if I could come back to you for a few moments, please. We were discussing

yesterday Exhibit 452D, which was that the penalty cost analysis document.

MR. DALZIEL: A. Yes.

Q. When was that analysis done?

A. My understanding is that analysis was done by around the end of October, beginning of November.

Q. And the document that we have in the form of Exhibit 452D, is that the document in the form in which it was produced around the end of October or is there some other study which underlies this exhibit?

A. The 452D was prepared as a response to the Interrogatory 10.26.29, I believe.

THE CHAIRMAN: Better give that a 683 number.

THE REGISTRAR: What was that interrogatory again, please?

THE CHAIRMAN: 10.26.29.

THE REGISTRAR: 10.26.29 becomes 683.4.

MR. MARK: Q. Would it be 10.26.27, Mr. Dalziel?

MR. DALZIEL: A. I believe it's 10.26.29.

Q. I think you will want to try 27. I have them both and it seems to me it's 27.

A. I have got an empty spot. I have an empty spot here at 10.26.27, so I am inclined to think...

Q. If I may, Mr. Chairman, I will just...

You can make a copy at the break, Mr. Dalziel. It is 10.26.27.

THE CHAIRMAN: Would you change that, Mr. Lucas, to 10.26.27.

THE REGISTRAR: Thank you.

---EXHIBIT NO. 683.4: Interrogatory No. 10.26.27.

MR. MARK: Q. So what you are indicating to me, Mr. Dalziel, is that the document in substantially the form it appears in 452 was initially prepared as a response earlier this year to that interrogatory.

MR. DALZIEL: A. That's correct.

Q. Now, my question was, what about -- so when was the initial work done and where is that study?

A. That initial work was done in, as I said, in October, late October or early November.

Q. Yes.

A. And when this interrogatory went in, we went back to the person who did that work in October

and asked them to document it as they did it at that time in response to this interrogatory.

So, my understanding is that the response to this interrogatory, which is 452D, reflects exactly what was done when the original analysis was done in October of 1991.

Q. And I assume the original analysis was documented in some fashion?

A. If it was, I haven't seen it.

Q. Has anybody on this panel seen it?

MR. SNELSON: A. It's referred to in Exhibit 452, I believe.

Q. That's the reference to the judgment that there is no advantage one way or the other?

A. That is correct.

Q. Well, I would assume, Mr. Snelson, correct me if I am wrong, that that statement in 452 must have been supported by some documentary reference that the authors of this document were looking at.

THE CHAIRMAN: This document being 452?

MR. MARK: That's right.

MR. SNELSON: I believe it was based primarily on the informal communication of the results of the analysis that are documented as Mr. Dalziel has described.

MR. MARK: Q. Was 452 produced by this multi-department committee that you spoke of with before?

MR. SNELSON: A. Yes, largely.

Q. Pardon me?

A. Yes.

Q. And you were on that committee, Mr. Snelson?

A. I was on it when I was available because through much of the time I was also here when Panels 5 and 6 were sitting.

Q. I appreciate that, but I am now just asking about the information process. To be frank with you, I am a little bit surprised to hear that the results of this study on the costs of overplanning versus underplanning and the comment in 452 is the result of an informal communication from someone.

Is there no documentation that the committee compiled before it prepared Exhibit 452 which reflected the conclusions come to by the analysts?

A. As I said, it would be informal communication at meetings and notes and so on. I don't believe there is a formal piece of paper that we could produce.

Q. Could you produce for me the notes or

the working papers of whoever undertook this analysis at that time?

MRS. FORMUSA: Mr. Chairman, I am going to object to responding to that undertaking.

Many of the studies and reports that have been produced as exhibits at this hearing represent the result of analyses and work that have been conducted throughout the course of the studies, it's those final documents that we are relying on.

If we get into all the various notes, working papers, overheads that were produced during the course of those analyses, then I think the amount of paper that we are getting into is far too detailed, and we are relying upon the final result of that work.

THE CHAIRMAN: This was an important study. The results showed, I guess, they would say had not a very significant different one way or the other as to planning the upper to the lower. But if those results had been significant then that would be a very pertinent point.

All we seem to have at the moment is 452D, is it, as in dog - that's not pejorative - and the statement, the sort of bald statement in 452. I guess if there isn't anything else, there isn't anything else. But I guess I am a little bit surprised

at that.

MRS. FORMUSA: We could take an undertaking that asked the witnesses to check with the individual who conducted the analysis to see if there was anything that would illuminate the analysis in 452D, if that will be helpful to the Board.

THE CHAIRMAN: There might be an explanation of why there isn't anything else, I don't know.

It just seems surprising to me, because it would seem to me this is crucial issue that one would want to look at in making this decision to change, in a fundamental way, the planning.

MRS. FORMUSA: We will make inquiries, Mr. Chairman.

THE CHAIRMAN: Thank you.

MR. MARK: Thank you, Mr. Chairman.

THE CHAIRMAN: Could we put an undertaking on that?

THE REGISTRAR: 684.4.

---UNDERTAKING NO. 684.4: Ontario Hydro undertakes to search for any further information in regard to Exhibit 452D.

MR. MARK: Q. Now, Mr. Snelson, can you tell me precisely, or as best you can, when the decision was made by this planning committee to adopt

the planning around the median approach?

MR. SNELSON: A. We believe that the idea was sort of percolating and coming to the fore around mid to late October, early November, in that time period.

Q. My precise question is when the decision was made. I can appreciate the idea was percolating for sometime, but when was the decision made?

A. As I said, the decision that was made by the working -- I said this yesterday, the decision that was made by the working group was to present to management the cases based on that approach.

Q. Yes.

[10:14 a.m.]

A. And that would be late October.

Q. And is that decision documented?

A. We don't know of any specific documentation other than the materials you have, 452.

Q. So to the best of your knowledge other than 452, the document dated January 15th, this decision or the reasoning behind this decision was never documented in Hydro?

A. 452 is the culmination of all of the considerations that were taking place through the time

that the Update was being made.

Q. Yes.

A. And that was the end product of the process of both working group activities, their discussions with senior management through various stages in the process that ended up with the Update Plan. And that is the final document that culminates and documents the whole of that process.

Q. No, I well understand that, Mr. Snelson, but this 452 is essentially a document for public filing before this Board; correct?

A. Yes.

Q. All right. What I am looking for is when the decision and how the decision was documented inside Hydro.

I assume your committee did not spend these few months and make these important decisions without ever reflecting those decisions for the benefit of yourselves or senior management in some form of communication, written.

A. The communications would be in the form of proposed cases, results of proposed cases, presentations to management, that type of materials.

Q. Well, are you telling me, Mr. Snelson, that from late October until the production of

Exhibit 452 in January that there was not a piece of paper from your committee or anybody on your committee or to your committee which documents or records or justifies the decision to go planning around the median instead of planning to the upper?

A. All the materials that we are aware of were in the form of notes and presentations to various levels of management review.

Q. All right. And could you produce for us, Mr. Snelson, the presentation that was made to whoever in management which reflects the decision made at the planning committee level to adopt the planning around the median approach?

THE CHAIRMAN: I take it this will be an objection, but let me just put what my concern is.

One of the things that I am interested in is why plan 452, at least why the changes that gave rise to 452 couldn't have been responded to through Plan 15 or the DSP, and I think that this represents a really fundamental change. I think what Mr. Mark is trying to find out is how that process developed, and I think that is a relevant consideration.

Now, if there is nothing, if these witnesses can't help us any more on that, then I guess we will just have to leave it at that, but it does

leave a gap, as far as I'm concerned.

MRS. FORMUSA: I think I agree with you, Mr. Chairman, in terms of the issue with respect to probing the witnesses regarding the changes that took place and the process that took place.

Our position yesterday on the motion that Mr. Howard argued was that the results of that planning process are documented in the exhibits that we filed before you. The MEA had asked for the various pieces of paper, presentations, et cetera, notes of meetings leading up to that, and we have taken the position that -- well, we have summarized or documented rationale for those changes, for those important decisions in our materials, and the witnesses can answer questions with respect to that.

We did not, in responding to that motion, feel that it was helpful to this process to get into the various presentation notes which again reflects the working group's, results of their studies at that point in time in a summary format, but we have put it altogether in the Update, for instance, or in the family of 452.

To go back and look through all the presentation notes, overheads, whatever those materials are, I am not sure about the utility of that. I am not

sure what can be gained from that that the witnesses can't already explain based on the documentation before you. That is the difficulty I am having and that is the difficulty we had in arguing the motion yesterday.

If we can be more helpful we are prepared to be, but I am not sure where this is leading to, other than going back and looking through all of this material which -- I don't know what the volume is. I am not sure that it is so voluminous as it is not in a format that would be very useful. We have tried to do that in preparing these exhibits for you.

If there was something very specifically that Mr. Mark could identify for us, then...

MR. MARK: Well, Mr. Chairman, what I have endeavoured to do thus far in my cross-examination, having regard to the order you made yesterday was be very restrictive about the particular documents I am asking about.

I confess to a bit of surprise that documents on this issue are causing such a fuss. But so Mrs. Formusa is clear, I think all the parties have been pretty good thus far in accepting evidence of the witnesses and not spending a lot of time and effort in probing the underlying documents.

But I think it is clear by this time, Mr.

Chairman, that on this issue that is just not sufficient, in our view. This is such a fundamental issue that we ought to be entitled to see some of the supporting documentation, the critical stuff. Especially when these witnesses at best can tell us that there was a series of informal discussions, I for one am not prepared with respect to simply take the blithe answers we get on the stand. This is a situation, we are entitled to see the presentations that were made internally - at least on some of the fundamental issues.

THE CHAIRMAN: But if there weren't any, then...

MR. MARK: Well, Mr. Snelson just said there were.

MRS. FORMUSA: I agree with Mr. Mark in terms of the material that underlies the analysis, and I think we have endeavoured as much as possible to provide that material.

We have given LMSTM runs. I know that is not what he is asking for. To me that is the analysis that supports the results of the studies that are in those exhibits.

A parallel presentation surrounding a certain issue like planning around the median, I don't

know what value there is. I can't see the value in going back and looking at the presentations in October and November, except perhaps to say, well, you said it that way then and now you are saying it this way. The rationale for that, for that process, for that change from planning to the upper to planning around the median has been described in our evidence in chief; it is in the supporting documentation that we filed before you. Quite frankly, I am not sure what those presentation notes are going to do except in yet another way say, well, this is what planning around the median is all about.

MR. MARK: Mr. Chairman, let me be clear, if I may just interject for a moment.

I think there are two issues.

One, these are decisions which the witnesses tell us were judgmental decisions. The LMSTM runs and the hard data are not going to help us one iota about these judgmental decisions.

No. 2, at this point in time, Mr. Chairman, I must take the position that I am simply not prepared to accept necessarily that everything which is in the filed documents today is an accurate reflection of the reasons for the decisions that were made some months ago.

Regrettably, I must say that one of our concerns at this point is that the presented rationale is different than the internal rationale. That is my concern at this point.

I would like to be able to say, as with other panels where we have always accommodated Ontario Hydro, that we don't have that concern. I have it now. I will put that on the record. And in that circumstance, Mr. Chairman, I frankly submit that there is just no room to adopt the usual Hydro position that if the witness says it was so, it was so.

---Off the record discussion.

[10:25 a.m.]

THE CHAIRMAN: This seems to be the same debate that we had yesterday and it is a difficult one. I think we would all concede that.

The planning process is an important and relevant part of this hearing. On the other hand, the internal details of how that process was developed present some great difficulties.

I have no idea whether this is the case but I suspect that a number of the issues that we have been talking about were the subject of vigorous debate within the organization, and that views were exchanged and issues finally resolved. That is the kind of

process that goes on in any large organization, and I don't think it is helpful to this Panel or useful to try and dissect that debate.

What we need to have at the end of the day is some explanation, as we tried to direct yesterday, of how the process was conducted and what documentation of a formal nature was produced and how it was arrived at.

We think that there should be no restriction at this time on the kind of questions that Mr. Mark wants to ask the witnesses, but we think the documentation ought to be confined to materials similar to that which are in the 452 appendices. If there is any other kind of material of that nature then it should be produced. If there is not, it cannot be.

But the internal debate, and who said what to whom, and who sent a memo to whom, and all that, I do not think we ought to get into.

MR. MARK: Mr. Chairman, perhaps I can ask this then. I don't think this offends your ruling. What I would like is the 646 type equivalent of that penalty cost analysis.

THE CHAIRMAN: If it exists.

MR. MARK: If it exists. Now I understood Mr. Snelson to say two things before: One,

that the analyst must have that work sheet, that data spread or it's in a presentation, and I don't care which once it comes from, but I would like the record --

THE CHAIRMAN: Isn't that the subject matter of 684.4? Isn't that what they said they will get?

MR. MARK: Very well then. You are correct, Mr. Chairman, I think that undertaking probably covers as much as you are prepared to go in the spirit of your ruling.

Q. Let me ask this, Mr. Snelson, 452 as we have it here is dated January 15th, 1992. Is that the actual date that that document was published or put in final form?

MR. SNELSON: A. Within a day or two, yes.

Q. So am I correct in understanding that you made the decision about planning around the median versus planning to the upper around late October; is that fair?

A. I think we said that was the point at which the working group decided to present the cases to senior management on that basis. Actually becoming a decision, then that was through the whole process of

the review and approval of the update plans, along with all the other factors that went into it. So as a corporate position it was not decided upon until the Update was finalized.

Q. I understand that. But the point I am driving at, Mr. Snelson, is that your work on the plans started after that working group level decision was made in late October?

A. There was work on the planning questions that Mr. Dalziel talked about prior to that.

Q. Yes. But then I am looking for the day when you actually started developing the six plans.

A. The six plans were evolutions of the previous cases, but the specific definition of them did follow that, yes.

Q. And when was the decision made by the board of directors on the plan which is now embodied in 452?

A. The Board meeting that considered this document, I believe, took place on December 19th, and the decision was sort of two-stage decision, it was substantially accepted but subject to some changes with authority delegated to the chairman. Sorry, December 9th, not December 19th.

Q. December 9th?

A. Yes.

Q. So subject to some changes, it went to the board of directors in substantially the form of 452 on December the 9th?

A. There was documentation that went to the Board that was very similar to 452, yes.

Q. All right. If you could turn to Exhibit 646, Mr. Snelson. I am interested first in a general way, if you can help me, when the various charts and tables and graphs that we see in here were prepared, certainly relative to December 9th?

A. Which particular charts and tables and graphs were you referring to? There are quite a lot in here.

Q. Yes. Is there a general answer? I mean, you are familiar with the document, did most of these documents follow December 9th or were these the types of documents which were available to you and presumably senior management before December the 9th?

MR. DALZIEL: A. Under attachment D -- sorry, attachment C of exhibit - I'm getting mixed up - Exhibit 646, there are the case descriptions of the update nuclear, update fossil and enhanced cases for median load forecast with surplus management. Those are consistent with the information that was presented

to the board of directors at the December 9th meeting.

Q. I'm not interested with whether the case descriptions are similar. Let's look at them particularly, Mr. Dalziel. Let's follow your lead and start with attachment C of Exhibit 646. The description of the case I gather you are telling me is consistent with what was prepared as of December the 9th?

A. Yes.

Q. Now, when we look beyond that, for example, to page C1-3, the load and capacity table, is that a document which would have been prepared at that time?

A. I think yesterday I said there were some minor improvements that were made between the December 9th board meeting and the final publication of Exhibit 452, but without any material changes I believe this is the same.

Q. So you had produced a document of this nature in substantially the same result as of December 9?

A. Yes.

Q. And if we look over at table B1, over on page C1-5, had that analysis been conducted as of December the 9th?

A. Sorry, which page?

Q. Page C1-5, table B1, Energy Production and Savings By Type?

A. That information would have been contained in the details of the LMSTM runs, it would have been available at that time.

Q. We all know the LMSTM is a rather voluminous complication of computer printouts, right, Mr. Dalziel?

A. Yes.

Q. Now had it been put into this sort of summary table as of December the 9th?

A. Not in this particular format, no. But much of the information, or some of the information contained here may have been presented in other ways. For example, the energies associated with the savings of the demand reducing options would have been known, that falls largely under the load forecast; it was generally known the energies associated with the purchase NUGs; the energies associated with the Manitoba Purchase are generally well-known; the energies associated with the new and existing hydroelectric facilities are generally well-known, and between the operation then of the existing nuclear system is generally a fairly common characteristic

between all of the cases, and that was illustrated in my direct evidence as well. There is some information that is presented in the form of graphs that would display the nature of the coal burns and the use of fossil fuels associated with the plans. That kind of information is typically available when cases are being described and discussed.

Q. When you say that the information is typically available, does that mean graphs similar to these would have been produced if we turn over to page C1-6 and C1-7.

MR. SNELSON: A. Mr. Mark, perhaps I can help there. If you turn to Exhibit 452, the main document, then a lot of energy information is presented on figures 9-1 through 9-3.

Q. Yes.

A. And that is the sort of way that information was presented at that time.

Q. At December 9th?

A. Yes.

Q. If we turn over to page C1-9, the three figures, C1, C2 and C3, the emissions forecasts, had these figures been prepared as of December the 9th?

MR. DALZIEL: A. Yes. I believe some of them are as well in Exhibit 452.

Q. Well, whether they are in 452 doesn't help me as to whether they were around on December 9th.

A. Yes, they are.

The reason I said related to Exhibit 452 is Mr. Snelson said earlier much of the information in 452 was made available to the board on December 9th.

[10:45 a.m.]

Q. If we turn over one more page to C1-10, table D1, the Costs?

A. Yes?

Q. All right. Now, I don't want to have to go through each of them. You have a similar table for all of the cases, do you not?

A. Yes, we do.

Q. All labelled Table D1?

A. Likely.

Q. All right. Using this as an example, can you tell me when this was prepared?

A. This table in this format to this level of detail was prepared, oh, probably in March or April, but the total plan costs would have been available at the time that the -- is available at a time that any plan is run using LMSTM, and so the total plan cost would have been available.

Q. It might have been available. Was it

calculated and presented?

A. I believe so.

Q. Now, you have told us before --

A. Mr. Shalaby's reminding me that borrowing and rate impacts were also presented.

Q. You told me before, Mr. Dalziel - perhaps it was Mr. Snelson - that you didn't use the RAM model in connection with the DSP Update. What did you use to calculate the costs which we have in the D1 tables in Exhibit 646?

A. There is a costing routine that applies the same methodology as the RAM model, and that runs in conjunction with the LMSTM, the application of LMSTM to model the cases.

Q. Is that part of the LMSTM, or is it a Hydro add-on?

A. It is a Hydro add-on.

Q. Why wasn't RAM used to do the costing?

A. RAM was developed specifically for the 1989 DSP, and it basically is a customized model, its main purpose was to carry out the cost risk assessment that is described in chapter 8 of Exhibit 6.

The length of time then it takes to customize that model and to get it up, running and

benchmarked against the costs that are produced from the add-on model to the LMSTM takes a lot of time and effort.

Q. So was the consideration time and effort?

A. It was partly that. It is also that the cost results that we needed to rely on at the time were available by this add-on application to LMSTM.

Q. As I understand the add-on application - and correct me if I am wrong, Mr. Dalziel - you didn't use that or couldn't use that to do any probabilistic analysis or sensitivities analysis?

A. That's correct.

Q. So my question is: Why wouldn't you want to be in a position to do that?

A. Because we had done, we felt, an extensive amount of work in doing that associated with the 1989 plans, and the lessons that we learned from that we still have those lessons with us today, and we felt that it wasn't necessary to go back and apply RAM to the Update cases.

Q. Would you agree with me, Mr. Dalziel, that it would be somewhat illuminating if we could have the RAM analysis to compare the cases you have now

presented with a case which included approvals for future major supply?

A. How do you mean, in the case that includes approvals for major supply?

Q. Well, take any case you have and apply for the approvals today so you have them, so you have your major supply facilities in a more timely fashion in the event of higher than median load growth.

A. Yes.

Q. All right. Now, were there any time constraints which prevented you from using RAM so we could have had some way of comparing the cases?

A. It is more a matter that in preparing the Update, in working towards the Update that the -- and this comes back to your earlier questions as to whether there was a decision on not to proceed with requesting approvals.

Just backing up and reviewing that process, then, beginning with the planning questions that were set out and in examining these planning questions there were some obvious changes that became very significant to the planners at the working level, they were also brought to the attention of management along the way, and there were a number of shared concerns and discussions that took place about these.

One of the major ones is the surplus and the impact of the surplus, and there are two major impacts associated with the projected surplus. One is that the need date for new major supply under median load forecast is pushed off much further in time.

The other is that the projected surplus provides a significant capability to meet higher than median load forecast out to around the year 2001 and even a bit beyond.

Another consequence of that is that to seek approvals today to an upper load forecast implies that we -- and given the median load forecast condition our expectation is that we would be arguing for these approvals with the intention of doing nothing with them for a period of four years or even more.

And it is those kinds of considerations that brought about the discussion as to whether we should be managing the uncertainty by planning around the median as opposed to applying the 1989 approach of seeking approvals according to the upper load forecast and to the full extent of the upper load forecast.

So in having made the recommendation, not so much a decision but a recommendation, that plans be developed more along the lines or around the median and recognizing that there is capability to respond to

higher than expected load growth - and coupled with that, for example, is the flexibility that is offered by the non-utility generation options to help out in responding to higher than expected growth - that the focus, then, became more on describing cases under the median load forecast condition.

Now, having reached that point, applying RAM to those sets of cases or at least having made that recommendation, that recommendation being accepted by management and in turn and ultimately accepted by the board of directors, applying the RAM analysis would not reveal any additional information, that would help with the decision that was accepted and made at the December board meeting.

Q. Wasn't one of the important factors in the decision to change to planning to the median one of cost, whether there was a significant cost one way or the other?

A. It was one item amongst many that was considered, and I would say that it was not the most dominating consideration at the time.

Q. So in other words, your evidence is, Mr. Dalziel, even if analysis had shown that it cost you nothing to obtain the upper load forecast approvals today the decision was made to not request those

approvals; is that the bottom line?

A. There was a recommendation based on the recognition, and largely it comes back to the projected surplus, and it is the things that I just described and the features associated and the consequences associated with a projected surplus that were the other factors that were major considerations along with the rough check on potential cost penalties as described in Exhibit 452D, and it is all together those considerations that led us to the approach of planning around the median.

Q. But my question is really this, Mr. Dalziel: What you are principally engaged in, am I correct, is a least cost planning exercise? Correct?

MR. SNELSON: A. No, we are engaged in an exercise of trying to select the best plan, and there are a number of factors, and cost is one of them.

Q. And let's assume you have one plan. Let's take the Update nuclear, and you design that plan, and now your question is whether you will seek approvals today for the facilities in that plan which you would use to meet the upper load or not seek those approvals today.

I take it at that point it becomes a question of which route is the least cost way to go; is

that fair?

A. That obviously could be a consideration. It was a consideration, as we have discussed, with respect to Exhibit 452D, but I'm not sure that it is entirely the considerations because there are other practical matters that come into it other than just cost.

Q. Well, once you have decided on one plan -- and let's assume for present discussion that it would be the update nuclear plan.

A. We haven't decide on the update nuclear plan.

Q. I understand. But you have put essentially two before us, or three if you include the enhanced, and you say, these are the three options for the future; right?

A. We have put those forward as being three alternative ways of meeting future, yes.

Q. And each of those could be accompanied by a request for the approvals to meet the upper, or not?

A. Theoretically, yes.

Q. All right. And my question is: Your decision whether to seek the approvals for the upper load forecast facilities I suggest at the end boils

down to a question of which is more economic, to have those approvals in your bank today or not.

A. Well, as I have said, cost is a factor, but there are other considerations.

Q. What else? What other factors? Once you have decided on a plan for meeting the future and the question up for consideration is whether to seek the approvals for the upper today or not, what other factors are there other than whether it is more or less cost effective to bank that approval today?

A. I think there are at least three factors.

One is the degree of success that one is likely to have seeking approvals so far off into the future that even while seeking those approvals you would be taking the position you will be doing nothing with them for a while. Another is the question as to the shelf life of approvals: how long would -- if you seek an approval too far in advance of need, then is it useful to you when you actually want to come to use it?

The third point goes back to essentially your hypothesis, which is that you have decided what is your plan for the future.

And as I indicated in my direct evidence, we are not in a position at the moment to make a clear

choice between the major baseload options at this point in time. There have been significant changes since '89 that I referred to in my direct evidence that affect, for instance, our preference or otherwise for either fossil or nuclear.

Q. All right. The first reason you gave was the chance of acceptance before this Board. So what you are telling me is you thought you may not get the approvals, so you are going to withdraw the request; is that the rationale?

A. In very simple terms, yes. But I think there is a common sense point that it is not worthwhile pressing a case when one has a very weak case.

Q. Well, "weak" in what respect?

A. Well, in the respect, for instance, as I said in my third point, which is that we don't -- at this point we haven't selected, and we are in a difficult position as trying to select, baseload options for the future because of changed circumstances since '89.

[11:00 a.m.]

Q. So really what you are saying, if we can boil this all down, Mr. Snelson, as I understand it, is that Ontario Hydro has simply decided it doesn't

know what it wants as its future base load supply so it's not going to request any approvals; isn't that it at its essence?

A. No.

Q. All right, let's start again.

Your weakness, your perceived weakness about whether you would get the approvals is because you are not sure you can make a good case one way or the other for one supply over the other supply.

A. That's not the only area.

Q. So what else?

A. That the need is so far off into the future and that the projections have such a degree of uncertainty associated with the future going out to, say, around the year 2010, which is when we would need it in the median load growth, that there are a lot of uncertainties in that time period.

Q. As we have discussed before, Mr. Snelson, if you obtain need and rationale approval today, you don't have to utilize that, do you?

A. That is correct.

Q. And if you obtain a need and rationale approval today, it saves you the need and rationale hearing costs in the future; correct?

A. Presuming that the approval obtained

today will still be considered to be valid in the future, which is not necessarily so.

Q. And you mentioned shelf life, and again if I can suggest to you, Mr. Snelson, if you obtain approval today and it becomes at some point what you consider to be stale, you don't have to use that approval, do you?

A. There is the question about how it becomes stale. We may try to rely upon it and then fail.

But even at you point out, if we were to consider it to be -- that the work had to be redone, then we could do so, but then that would be at the expense of having gone through the previous process with no effect.

Q. Well, your cost in this hearing for need and rationale, let me suggest to you, Mr. Snelson, is pretty well sunk and fixed. The costs of this hearing aren't going to change considerably because of your Update, is it?

A. I couldn't comment on that.

Q. Isn't it reasonable that it is not going to change materially, Mr. Snelson?

A. I'm not sure.

Q. You are not prepared for that, all

right.

So now we have dealt with the question of the shelf life, we have dealt with the question of your decisions may end up being far in the future so you may not want to commit to a decision today.

Let me suggest to you again, Mr. Snelson, that it all boils down to the fact that you just don't want to say whether you want fossil or nuclear today?

A. I believe that the situation is as I described in my direct evidence, that we believe that we have flexibility to respond to upper load growth and we don't need to make that choice today. It is a choice that if we had to make it today, it would be a very difficult choice, but we don't need to make that choice today.

Q. I suggest to you, Mr. Snelson, because you say it's a difficult choice, that is essentially why you have opted to defer the decision?

A. And as I have indicated --

THE CHAIRMAN: He has given a number of reasons. I don't know if you have to go around this again. I think this is getting argumentative.

MR. MARK: I will move on.

Q. Mr. Dalziel, before I leave this, let me take you back to where we started at 646. You

referred me to Section 3, or pardon me, attachment C, when you were discussing when these documents were prepared.

MR. DALZIEL: A. Yes.

Q. And these, as I understand it, all deal with the median load forecast scenario in attachment C?

A. Yes.

Q. And if we want any documentation with respect to upper and lower load forecast, we must go to attachment D?

A. Yes.

Q. And my question, Mr. Dalziel, is when were these documents prepared reflecting the upper load forecast, upper and lower load forecast scenarios?

A. Work on these cases began, I think, in February or March, so these cases --

Q. Of this year?

A. Of this year, 1992.

Q. So am I correct that it was only after publication of 452 that you commenced your work on modelling and producing these results for the upper load forecast, and I would assume - correct me if I am wrong, Mr. Dalziel - for the information that we see in portion E as well which is the no approvals case?

A. Yes, that's correct.

Q. Mr. Dalziel, there has been some discussion certainly throughout the evidence of this panel that one of the factors which you considered when moving to the planning approach you did was the price and availability of natural gas; is that correct?

A. Yes.

Q. And have you done any assessment in terms of sensitivity analysis with respect to natural gas prices on any of your proposed plans?

A. No.

Q. And of course sensitivity to fuel prices was one of the things that the RAM model would have permitted you to do?

A. Yes, it looked at sensitivity to nuclear and fossil fuel prices.

Q. Maybe at this point, Mr. Dalziel if we could just turn to Exhibit 685 which is the package handed out yesterday. You see I have included the entirety of two interrogatories responses, 10.9.60 and 10.9.61. And if we look at --

THE CHAIRMAN: Can we just record those numbers, please. 10.9.60.

MR. MARK: Yes.

THE CHAIRMAN: And 10.9.61.

THE REGISTRAR: The first one 10.9.60 is .5, and the second one 10.9.61 is .6.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 683.5: Interrogatory No. 10.9.60.

---EXHIBIT NO. 683.6: Interrogatory No. 10.9.61.

MR. MARK: Q. If we look at the second page of 10.9.60, which is actually an excerpt from another interrogatory response, do we see there, Mr. Dalziel, a description of the variables which the RAM model permits you to use in the probability analysis?

MR. DALZIEL: A. Yes.

Q. And if we look over at the next interrogatory, and particularly beginning at page 17, we see here an example of the type of probabilistic scenario that the model sets up to permit you to do your analysis?

A. That's right.

Q. And whether you use the RAM model or not, as I understand it, comparable analyses with respect to the Update have not been carried out?

A. That's correct.

Q. Mr. Dalziel, as I understand it, you have now filed with us the system incremental costs which are your latest. We have those now, do we, filed? I forget the exhibit number.

A. I think it is Exhibit 592.

Q. And those were created as of when?

A. They were February/March 1992.

Q. And have you done a further iteration of any of the update plans with the new system incremental costs to see what results you get?

A. No, we haven't.

MR. SHALABY: A. I indicated in my evidence that the system incremental costs gave us confidence that the NUG targets and the demand management targets are achievable, and that the hydroelectric program is cost-effective.

Is that what you meant by using the system incremental costs in an iteration? Because that's what we mean by it.

Q. So your answer is you did do an iteration?

A. We re-evaluated the NUG and demand management and hydroelectric, and that is an iteration, yes.

It's confirmation, it's iteration to confirm that those amounts are achievable.

Q. All right.

A. We didn't go back and revise the plan.

Maybe what people mean by iteration could be different.

We took the incremental values, confirmed that the components of the plan are viable, and stopped there. We have didn't go back and tamper with anything else.

Q. You say tamper, in some cases would you go back and do that iteration?

A. If there was inconsistency, if there was, for example, avoided costs that are not sufficient to achieve some of the components, we will go back and adjust that, yes.

But that iteration was sufficient. We were satisfied that the plan was consistent and achievable, we didn't have to change any parts of it. We call that, closing the loop is what we call it.

Q. Mr. Shalaby, if I could ask you to turn, please, in Exhibit 646, to page 7, and if you could look in particular at paragraph 25. Mr. Shalaby, three lines up from the bottom it says:

> Virtually all of the demand management options included in the 1989 Demand/Supply Plan as described by Panel 4 continue to meet the screening criteria.

Were there some that didn't?

A. My recollection is there was one, and I forget when it was, residential measure, window retrofits or ceiling of some sort. One measure.

The word virtually because out of the 50 or 60 or 100 options evaluated, one of them did not make it, and it was such a minor one that it did not affect the plans.

Q. As a matter of curiosity, do you know whether it's still being implemented?

A. No, I don't.

Q. And with respect to non-utility generation, it continues:

> There is an impact on non-utility generation, especially major supply NUG in the 1990s.

Have any changes been made as a result of that revelation?

A. As I indicated, the NUG plan, a good portion of it is already in place or committed or not under negotiations. So the question of whether avoided costs will enable a lot or little in terms of additional major supply NUGs did not if take away our confidence that the NUG plan is implementable or achievable. So that conclusion didn't take away from

our confidence in the NUG plan.

Q. You indicated that the NUGs are either implemented or under negotiation or committed, and I just want to understand where you are going with this. Is your evaluation of the impact of the avoided cost on NUGs, does that have any effect on how you negotiate with NUGs and what your targets are?

A. Well, they have an impact in that new NUGs, people applying this current circumstance would be evaluated using the current values. So not as many proposals will be economic in the short term as would have been if the previous avoided costs would have been applied.

Q. Is there some report to you or someone else, Mr. Shalaby, which reports on the testing of the demand management program against the new system incremental costs?

A. Yes, there is.

Q. Could you produce that for us?

A. Yes.

MR. MARK: Could we have an undertaking number for that?

THE CHAIRMAN: 684.5, is it.

THE REGISTRAR: That's correct, Mr. Chairman.

---UNDERTAKING NO. 684.5: Ontario Hydro undertakes to provide a report which reports on the testing of the demand management program against the new system incremental costs.

MR. MARK: Q. Panel, let me turn for a few moments to the question of the demand forecast. Now I don't think we have any load forecaster. Who is best equipped to deal with that?

MR. SHALABY: A. I will try and handle what comes on.

Q. Now, I want to deal firstly, Mr. Shalaby, with the question of demand management targets. Now, in the evidence in chief, and I apologize, I don't recall if it was you, I understand that there have been two minor adjustments or two adjustments at any rate to the 5,200 megawatt forecast that came out of Panel 4.

A. Yes.

Q. And they total, as I understand it, about 380 megawatts.

A. I said about 400 in evidence.

Q. Am I correct in assuming that your demand management target for the year 2000 is now roughly 4,200?

A. No.

Q. Pardon me, 4,800?

A. Not that either. And not 4,820 either.

No, I said that the plan has taken away some discount demand service and load shifting, but the target continues to be at this time 5,200.

There is a discrepancy between the target and what is in the load forecast at this time. We haven't had that for some while. There has been an effort to line up the targets and the plans. This year the reaction to time-of-use rate results last year and the discount demand service prompted people to signal that in their plans, that's really a signal to correct for it elsewhere or to recovery it elsewhere. So the target remains as 5,200.

Q. So in Panel 4, that panel gave us what was their best estimate or their best forecast of achievable DSM by the year 2000; correct?

A. They did.

Q. And you have since that time seen a shortfall of approximately 400 megawatts in two programs because uptake, perhaps for perfectly sensible reasons for the customers, just aren't happening as you would expect it; correct?

A. That is correct. Now, it's not totally unexpected. Mr. Harper in Panel 4 spoke about

implementation issues with time-of-use rates, I am not going to say as you recall, I don't think anybody would recall that. He talked about time-of-use rates and implementation issues, and in fact, that was starting to understand what the uptake is sensitive to and so on. So it wasn't without discussion. We knew that time-of-use rates is going to be a difficult climb up.

Q. It was a risk that you were aware?

A. That's right.

Q. But as a result on those two programs you are falling short of your best forecast.

[11:20 a.m.]

A. That is correct.

Q. And as I understand what you are telling me, Mr. Shalaby, rather than revise your forecast you have simply determined you will get those savings from some program you have not yet identified or in some mechanism you have not yet identified?

A. Well, that is not new to demand management. We have not yet identified where everything will come from either.

Panel 4 gave evidence that we know where the potential is, we know what needs to be done to achieve the 5,200 megawatts, but not every program has been designed and not every detail has been worked out.

So that is in the spirit of learning our market and learning our customers and learning how they respond to these programs as we go along.

Q. Do you have any sense --

A. That is the nature of implementing demand management; that is the nature of working with millions of customers.

Q. All right. So even though we have demonstrated shortfalls in programs you have already identified, as a system planner you are comfortable with maintaining a forecast of 5,200 megawatts?

A. Yes.

Q. Even though Mr. Burke told us in Panel 4 that 5,200 was his best estimate of a median forecast, and you are not concerned by the fact that you already have 400 megawatts of demonstrated failure in a few months since then?

A. We see that -- you are characterizing it as a failure and we are --

Q. Shortfall. I don't mean to --

A. Well, it is short of targets, but it is a signal that these programs are not being taken up as quickly as we thought. And one of the values of plans is to alert decision-makers to what is falling short and what corrective action should be taken. So

it is doing its job. When people said this wasn't taken up as much in 1992 it is making the program people sit up and decide how else to recover that.

THE CHAIRMAN: Just so I am clear, is there a distinction between the demand management forecast and the demand management target?

MR. SHALABY: This year there is. They used to line up in the past. You are right, Mr. Chairman. There is a difference.

THE CHAIRMAN: Well, is the distinction quantified by the 400 megawatts we are talking about?

MR. SHALABY: Yes.

MR. MARK: Q. So just to summarize, as I was going to, Mr. Shalaby, your target is still 5,200, but today your forecast for the year 2000 is 4,800?

MR. SHALABY: A. That is correct. There is also merit in keeping targets stable. It is a signal to the outside community that we are working with to implement demand management of our resolve and commitment to those targets.

So there is merit to setting targets and not changing those continuously. You change those only when there are major reasons to change them. And we didn't figure that was a major enough reason to change the target.

Q. But what you are highlighting for us, Mr. Shalaby, is the fundamental distinction between a forecast and a target.

A. Yes.

Q. And now, if you could turn with me, Mr. Shalaby, to the errata to Exhibit 452A and B; do you have that document?

A. Yes.

MS. PATTERSON: I think we have destroyed our errata because we have new versions.

MR. MARK: Well, I have a document, a separate document dated April 5, 1992. I haven't cut and pasted, so I don't know if we all have the same one.

THE CHAIRMAN: Well, let's see how we get along.

MR. MARK: All right.

Q. Now, if we turn over to page 8 --

MR. SHALABY: A. Yes.

THE CHAIRMAN: Is that figure 7-1?

MR. MARK: No. Mr. Chairman, perhaps this would be a good time to take the morning break and we can get a common set of documents.

THE CHAIRMAN: That is not --

MR. MARK: Mine is not labelled that way.

MRS. FORMUSA: Mine is.

THE CHAIRMAN: We will break then for 15 minutes.

THE REGISTRAR: Please come to order. This hearing will recess for 15 minutes.

---Recess at 11:28 a.m.

---On resuming at 11:46 a.m.

THE REGISTRAR: Please come to order. This hearing is again in session. Please be seated.

THE CHAIRMAN: Mr. Mark?

MR. MARK: Mr. Chairman, during the break we attempted to resolve this issue, and we resolved one as to inserting my page into the original 452(b) exhibit, but we have noticed that there is another problem. The errata purported to be a reconfiguration of the table. On examination it appears that the absolute numbers have changed as well.

The witnesses who are present today aren't able to reconcile that, so subject to your approval Mrs. Formusa and I have agreed that we will have an undertaking to reconcile those, and if I have any further questions I can pursue that at a later time.

THE CHAIRMAN: All right. That will be 684.6 then?

THE REGISTRAR: .6, Mr. Chairman.

---UNDERTAKING NO. 648.6: Ontario Hydro undertakes to resolve figure discrepancies on Exhibit 452B.

MRS. FORMUSA: Perhaps for the record we should just note the correct title and page on that document, Mr. Mark.

MR. MARK: That's right. We are concerned with what was page 8 of Exhibit 452B, which was titled: Demand Management, Plan Update to figure 7-22, Plan Update Managed.

THE CHAIRMAN: What that means I suppose will become clear one way or the other later on?

MR. MARK: Hopefully.

Q. Mr. Shalaby, I see you are looking at those. Let's turn to something else for a moment. We will work that out later.

Now, am I correct, Mr. Shalaby, recalling from your direct evidence that the forecast of electricity prices in the new forecast is up 13 per cent from what it was in the previous forecast?

MR. SHALABY: A. I gave that evidence as what the load forecaster took into account in adjusting the 1990 forecast and updating it to the Exhibit 467.

Q. Right. The financial and the rates analysis has shown that we have a real rate which is 13

per cent higher than we did under the previous forecast, and that has been fed into the forecasting process; is that correct?

A. That is correct.

Q. And, Mr. Shalaby, would you agree with me that one of the things that your load forecasting model does is it incorporates the natural EEI that you will obtain because of higher real electricity prices?

A. I am pausing here and wondering whether I get into what the load forecasting models do and do not do.

I think Panel 1 gave ample evidence in that regard. So what I am saying is my recollection of what Panel 1's evidence is - and it is not to be interpreted as new evidence or something to override...

The economists get terribly upset if anybody says anything different than they do, so I am not going to say anything different than what the Panel 1 evidence was.

In a nutshell, to be helpful here, yes. The natural EEI is part of the load forecasting process.

Q. All right. And, therefore, you would ordinarily see, with a material increase in the real

price of electricity, you would see some savings that you previously were going to get through your demand management programs, would move into the natural EEI category?

A. Theoretically, that is the correct direction, yes.

Q. And if I understand correctly your evidence in chief and what you just spoke to me about a few moments ago, there has been no reduction in the forecast of your demand management results that reflects any shifting from your demand management program savings to the natural EEI savings?

A. No, that has not been done. My answer was that theoretically what you are saying is correct. I am not sure whether the process of updating the load forecast went into that detail or not. I am unaware of that.

Q. Doesn't the load forecasting model have within it, built into it, the automatic adjustment to EEI depending upon the real price of electricity?

A. I don't know how automatic it is, and the load forecasting people tell us what they did is update the 1990 load forecast; they did not issue a new forecast. And the distinction there, I suspect, means that they did less than a complete rerun of the load

forecasting for this --

Q. Perhaps we can then, Mr. Shalaby, if you can't deal with it any further, deal with it by way of undertaking. What I would like to know is what impact the real electricity price increase to the year 2000 has on natural EEI and on your demand management program targets and whether any adjustments to the demand management program have been made as a result.

THE CHAIRMAN: I thought he said there hadn't been any made. What you wanted to know was to what extent had there been a treatment of this natural EEI in the current load forecast. I thought Mr. Shalaby's evidence was there had been no adjustment to demand management forecasts.

MR. SHALABY: That is correct.

MR. MARK: So then perhaps the second part that I want, Mr. Chairman, is: Should there be any adjustment to the demand management forecast as a result?

THE CHAIRMAN: Well, all right. I guess what you want to know is what, if anything, was done about natural EEI in the load forecast?

MR. MARK: Yes.

THE CHAIRMAN: And if anything was done should there be any adjustment?

MR. MARK: That's correct.

THE CHAIRMAN: All right.

MR. MARK: And just to save time, Mr. Chairman - I can deal with it now - I was going to move on to the question of fuel switching to deal with the --

THE CHAIRMAN: Hold it just a moment.

DR. CONNELL: I just wanted to intervene, Mr. Mark, and clarify. In putting that question are you assuming that all elasticity of demand can be attributed in some way to EEI, or are you distinguishing between price elasticity and impact on EEI?

MR. MARK: They may be the same. The concept basically is that as your price increases some savings that you would have to resort to programs to achieve will occur naturally simply because of the price incentive. I don't know if that helps you, but that is the concept.

DR. CONNELL: I suppose we can just assume that the people that are responding to the question can deal with it in their best light.

MR. MARK: And just to move on from there, Mr. Chairman, I wanted to deal with a similar subject - and I assume Mr. Shalaby would do this by way

of undertaking as well - and that is this, that the same question with regard to fuel switching: whether there has been any shifting of what was otherwise savings from the fuel switching program are now going to be achieved naturally, and a similar question, having -- that is the similar question.

Just with regard to the fuel switching, having also regard to the fact that as indicated in Exhibit 467 at page 5, there is now a forecast of a further reduction in natural gas prices to 7 per cent, an additional 7 per cent by the year 2000.

THE CHAIRMAN: Is that a third question?

MR. MARK: We can make it all one undertaking.

THE CHAIRMAN: It is a similar question. Does it have a similar answer?

MR. SHALABY: It will go to the same people to answer. I would prefer it to be a single undertaking.

THE CHAIRMAN: So can we wrap it into one undertaking, which would be 684-point...?

THE REGISTRAR: Seven.

THE CHAIRMAN: Seven?

Could I ask you, Mr. Shalaby, if you know: will there be another load forecast, and if so,

when would you expect that to occur?

MR. SHALABY: The answer is "yes", there will be another load forecast. That is safe to say. Usually it comes around December of the year. It is approved by our board typically in December of the year. So if things go as usual we will have one in December, 1992.

---UNDERTAKING NO. 684.7: Ontario Hydro undertakes to provide the impact of the real electricity price increase to the year 2000 on natural EEI and demand management program targets, and whether any adjustments to the demand management program have been made as a result; also, should there be any adjustment to the demand management forecast as a result; and having also regard to the fact that as indicated in Exhibit 467 at page 5 there is now a forecast of an additional 7 per cent by the year 2000; and also do the above for fuel-switching.

MR. MARK: Q. Now, Mr. Shalaby, if you could turn, please, to Exhibit 452, page 9? Actually, if I could have you start at page 8 under the heading Demand Management Uncertainty, are you with me, Mr. Shalaby?

MR. SHALABY: A. Yes, I am.

Q. And as I understand it from this description in the figure the uncertainty associated with potential for and penetration of demand management programs is incorporated in the uncertainty bandwidth

we have in the primary forecast?

A. Yes.

Q. And if we go over to page 9, am I correct in my conclusion that in addition to the risk of potential and penetration which is incorporated in the primary forecast you have what you call the mandation risk?

A. Yes.

Q. Right. And as I understand the narrative and the graph what you are indicating is that there is a risk associated with mandation that you will not achieve the forecast result because of lesser standards being brought in by the government than your Panel 4 people predict?

A. That is correct.

Q. And you estimate that risk at 2,600 megawatts; in other words, the risk is that you will underachieve your forecast by 2,600 megawatts?

A. By the year 2014?

Q. Yes.

A. Yes.

Q. Do you have any estimate of the risk in megawatt terms to the year 2000?

A. It is not evident from this page, but one can sort of eyeball it from the graph and for

purpose of this discussion maybe half of that or a little less than half.

Q. All right. And, Mr. Shalaby, luckily I am instructed that if you look at page 6 of Exhibit 452A, figure 3-2--

A. Yes?

Q. --this gives us those absolute values, does it?

A. That's correct. And in the year 2000 it shows that the mandation risk is .9 gigawatts, which is 900 megawatts.

Q. All right. Thank you. Ms. Howes, if I could turn to you for a few moments, please, am I correct in my understanding that in the update plans, the update nuclear and fossil plans, you are proposing for your facilities environmental controls additional to those contained in the DSP?

MS. HOWES: A. In the 1989 plan?

Q. Yes.

A. Yes.

Q. And, of course, in the enhanced plan there are even more controls than you propose in the Update Plan?

A. That's correct.

Q. Sticking for a moment to the Update

plans - that is, the nuclear and fossil as opposed to the enhanced plan - how did you arrive at your objectives for your environmental control program?

A. I don't quite understand the question, arrive at the objectives?

Q. Well, in broad terms how did you decide what control, what level of control was appropriate?

A. Appropriate. As I said in my direct evidence, we looked at possible future regulations. The three that we specifically identified in my -- or that I specifically identified in my direct evidence were acid gas, so SO(2), NOx/VOC, and CO(2) were the major ones.

[12:00 p.m.]

Q. And do I take it from that, Ms. Howes, that the controls you are proposing in the update nuclear and fossil are intended to comply with your anticipated future regulatory limits?

A. Yes.

Q. And they are not intended to go beyond those anticipated future regulatory limits?

A. You can appreciate there is some uncertainty about speculating what the future regulatory limits are. And if you will note from the

graphs, that yes, the emissions that we were estimating were below the dotted lines which in many cases indicated a possible regulation, possible limit.

Q. So in some instances you are proposing controls which will exceed what you anticipate the limits will be?

A. Do better than, yes.

Q. And what evaluation, if any, did you make to determine what levels of controls were appropriate and in which areas you should be striving to do better than the anticipated future limits?

A. I think I covered that quite extensively in my direct evidence when I gave the rationale for the possible regulation and possible limit lines on the graphs that I used to describe the update nuclear and update fossil plans.

Q. You will forgive me, Ms. Howes, I have read your evidence in chief, I may have missed something, but I don't recall from that evidence that you described for us how you determined what levels were appropriate where they may exceed the anticipated future limits.

A. Let me use an illustration, the comments on SO(2) levels. What we referenced was our current regulation, what we referenced or what I

referenced was discussions that have been held through the federal Green Plan, discussions with the Council of Environment Ministers that suggests there will be some reduction in the acid gas controls or limits, I should say.

I also referred to the scientific rationale for the acid gas regulation and speculated that, or not speculated, indicated that current scientific evidence suggested that current level is inadequate and that there would be some reduction in the acid gas limits beyond the year 1994, and that was the rationale that I provided for our use of in this case scrubbers on our fossil stations on the existing system.

Q. All Right. So are you telling me that in that case you are meeting an anticipated future limit?

A. We are doing slightly better than the future limit.

Q. Yes, but was your intention to adopt controls which would simply permit you to comply with the anticipated future limit, or have you made a decision to do better than the anticipated future limit?

A. These plans illustrate doing better

than the existing regulation.

Q. And my question to you, Ms. Howes, is, what is the rationale for that and how did you determine the appropriate level of controls in excess of the -- to let you do better than those future limits?

A. We use the commercially available control technology and assume that on the system, particularly if you recall on the life-extended system, or stations Nanticoke and Lambton, there was I would say a planning recommendation that we do better than the regulation in the series of plans, and I think what we have assumed in terms of controls indeed does better.

Q. And this planning recommendation, where did that come from?

A. I would suggest that it came through the planning process that we followed in the period that has been described September to December, 1991.

Q. So that was another decision taken by this planning committee that Mr. Snelson has spoken of?

A. Well, as well there are other activities under way within Ontario Hydro than just this planning process, and I think there is generally some discussion of our environmental performance

outside of just this particular plan.

Q. Is there some corporate policy or strategy which has been adopted that deals with this matter of doing better than the anticipated future levels?

A. Yes.

Q. And has that been provided to us? Do we have that on the record?

A. To the extent that it is discussed through this plans it has.

Q. Does it exist in the form of a document of a strategy or policy that's been issued by the Corporation?

THE CHAIRMAN: You are aware, I take it, Mr. Mark, that Ontario Hydro furnishes an environmental report annually in which the policy of the Corporation with respect to environmental matters is set out?

MR. MARK: Yes.

THE CHAIRMAN: But this is something more than that?

MR. MARK: I gather from what Ms. Howes is saying, this is something more than. If it's not, that is fine. I took it from the answer that it was.

MS. HOWES: Yes, there is something more than that. I am just trying to find the exact place in

this document.

What I was specifically referring to was a phrase in here, Ken has just found it, it's on page 12 of Exhibit 452. On page 12 it's the third paragraph, and it's about the middle, it begins the statement:

> Customer and government expectation and Ontario Hydro's own corporate responsibility strongly support a planning position which states that Ontario Hydro will anticipate and act in advance of future environmental regulations. This position is particularly important when considering greater use of existing supply through life extensions.

MR. MARK: Q. Yes. That suggests to me, Ms. Howes, that you will plan today for future anticipated limits.

MS. HOWES: A. And act in advance.

Q. Act in advance, Ms. Howes, suggests to me that you will act today before those future regulations come into force.

A. I think there is enough latitude in there to suggest that we might do better than the

regulations, not just have the emissions to exactly meet the limits that are imposed.

Q. Is this phrase in here, the extent of the Corporation's documented policy on exceeding rather than just meeting the future anticipated limits?

DR. CONNELL: Ms. Howes, if I could supplement Mr. Mark's questions. We heard, particularly in Panel 9, a great deal of evidence concerning the ALARA principle. Is it reasonable to assume that that principle applies to all emissions and would embrace the present case as well, the SO(2)?

MS. HOWES: It certainly would. I was stumbling over his comment about documentation. I am not sure that there is explicit documentation, but yes, the principle of ALARA would apply.

DR. CONNELL: There is certainly a lot of oral evidence on the record.

MS. HOWES: Absolutely.

DR. CONNELL: I can't recall myself what documentary evidence was filed.

MS. HOWES: That's right.

MR. MARK: Q. So my question, this is the extent of where we find the authority for the initiative to exceed the anticipated future limits?

MS. HOWES: A. No, I would say the

authority probably rests with our board, but yes, that represents the documentation that is available.

Q. And have you done any analysis of the costs your customers will pay under of the Update plans to exceed those anticipated future limits?

A. Certainly those costs were done. I cannot speak clearly to the costs, that lies with expertise elsewhere on the panel, but yes, those costs were taken --

Q. So that analysis has been done?

A. Yes. And in particular if you compare the cost of the enhanced plan, for example, which has additional controls as you stated, with the update nuclear and update fossil you will get some sense of the additional costs that are incurred, would be incurred.

Q. For the moment I am more particularly concerned in the update nuclear and fossil plans, the analysis of the additional costs which are being paid for the controls which exceed the anticipated future limits. If that analysis has been done, I would like to have it produced.

A. As you are probably very familiar, in the back end this exhibit, 646, there are cost estimates of all of the plans which include the cost of

all of the controls. We did not specifically run cases that strictly adhered to the regulation and then compared them with the set of cases that are costed in the back.

Q. So you don't know what the incremental cost is or will be to your customers for achieving environmental standards that are better than the anticipated future regulatory limits?

A. I don't know the precise financial costs, that's right.

MR. SHALABY A. We have ideas from the incremental costing for scrubbers, for example, that it is about $10 per megawatthour. Numbers like that can be used to give you a general sense of what the costs will be.

Q. But that hasn't been done. You haven't done that to give you an estimate of what those incremental costs are?

A. Well, the estimate of incremental scrubber costs is the something that we talked about at length in Panel 3. All I am saying is it can very easily be extended to take any amount of reduction that you would like and roughly multiply it by $10 a megawatthour. I am trying to be --

Q. I appreciate that, Mr. Shalaby. But

my question is you haven't done that extension; am I correct?

A. It's not documented here, you are right.

Q. But has it been done?

A. Not to my knowledge, no.

MS. HOWES: A. No. But as Mr. Shalaby said, we could certainly estimate it for you.

Q. Could you do that?

A. Sure.

THE CHAIRMAN: Would the difference between the enhanced plan and the fossil nuclear plans be a helpful guideline.

MR. SHALABY: Yes.

MR. MARK: That is for the second. I was going to go on to the next one, the comparison of the enhanced to Update. I would like to deal with this one first, Mr. Chairman, if we could.

MS. HOWES: Could I just clarify what specifically you are looking for, just SO(2)?

MR. MARK: Q. Is that the only one where you anticipate exceeding the future limit in your performance?

MS. HOWES: A. The trouble with exceeding, exceeding means going over. You mean doing

better than.

Q. Doing better than.

A. I think it is probably true for NOx as well.

Q. All right. Could you do it for both of them, please.

MR. SNELSON: A. I would just give one caution, Mr. Mark, and that is that when you estimate the cost of being exactly on a regulation, then if it is a regulation you actually have to plan to be below it to give some degree of assurance that you will not exceeding regulation. So there is a kind of a nicety here in terms of analysis that one may estimate the cost of being exactly on the regulation. But in the real world, if it's a regulation you have to plan to be below it to give yourself a reasonable degree of confidence.

Q. If that's something you want to discuss or if you can't quantify it in the analysis, that is fine, I will accept that as a caveat.

Can we have a number for that?

THE REGISTRAR: 684.8.

---UNDERTAKING NO. 684.8: Ontario Hydro undertakes to provide incremental cost of exceeding future regulations over meeting future regulations.

MR. MARK: Q. If we turn to the enhanced

plan for a moment, Ms. Howes, would the comparison of the total cost of the enhanced plan versus the Update plans be a reasonable way to get a handle on the incremental environmental control costs.

MS. HOWES: A. Certainly.

Q. Lastly on this subject, Ms. Howes, when you sat down to consider an updated plan, did you re-examine at all any of the environmental or the emissions implications stemming out of your non-utility generation program?

A. Yes, we did.

Q. And what conclusions did you come to?

A. You will find information on the emissions, wastes, et cetera, from NUGs in Exhibit 452E, and specifically pages 61 through 72.

Q. This is where you have simply modelled the anticipated emissions from the non-utility generators?

A. Yes.

Q. So these are the emissions from all your sources of generation?

A. No. As the title suggests, it's from NUGs, non-utility generation.

Q. Sorry, what page are you on?

A. 61 through to 72.

Q. Of which exhibit, E?

A. 452E.

Q. Sorry, I don't have a heading called NUGs until page 64.

A. 452E?

Q. Are you starting with the one that says NUGs SO(2), NOx, Acid Gas Emissions, (ANC) Multi-Case Multi-Var Cumulative?

A. Cumulative, Median Load 1992-2017.

Q. We will start there. It's my page 64, but it seems we are on the same table.

A. Okay.

Q. I take it, Ms. Howes, that Ontario Hydro's policy is still not to include the NUGs emissions in your emissions limits?

A. We are also not required to.

Q. I understand that.

[12:23 p.m.]

If you turn to Exhibit 4, Ms. Howes - do you have that, the environmental analysis, page 4-3, figure 4-1 - and has that been updated since the publication of the Update?

A. I don't think I have ever put all three of them on the same graph, but I think it is -- certainly the information has been updated. It is

based on the Update.

Q. Is it possible for you to update this graph and the two notes under it for us?

A. I think that would be possible.

MR. MARK: Could we have an undertaking number for that?

THE CHAIRMAN: It is not done somewhere else in the materials; is that right?

MS. HOWES: Not specifically this configuration. There are independent tables that show SO(2) and one CO(2) and one NOx. I don't think I have put them on one graph.

MR. MARK: I am also concerned with the notes, Mr. Chairman--

MS. HOWES: Yes, I recognize.

MR. MARK: --which I don't think is anywhere in the Update material; am I correct, Ms. Howes?

MS. HOWES: No. That would not be a difficult calculation.

MR. MARK: All right.

THE REGISTRAR: 684.9.

THE CHAIRMAN: 684.9.

MR. MARK: Thank you.

---UNDERTAKING NO. 684.9: Ontario Hydro undertakes to provide an update to the environmental analysis, page 4-3, figure 4-1.

MR. MARK: Mr. Chairman, that concludes my questions.

THE CHAIRMAN: I would like to ask Ms. Howes one question while it occurs to me, and that is, you say you don't include the NUG emissions in your limits because you don't have to. Have you ever considered doing that or thought about that?

MS. HOWES: I think there was a fair amount of discussion of that in Panel 5, and I think, if I recollect my reading of the transcripts, at that time it was Hydro's position that the responsibility for the emissions from the NUGs should lie with the operators themselves, and they are in the best position to control those emissions, not Ontario Hydro.

THE CHAIRMAN: Thank you.

MR. MARK: As I was saying, Mr. Chairman, that concludes my portion of the cross-examination. Mr. Watson is ready to proceed with the balance.

THE CHAIRMAN: Thank you.

MR. R. WATSON: Thank you, Mr. Chairman.

I would like to start by introducing the next exhibit. It is a compilation of materials to which I will be referring. Mr. Lucas has copies for

the Board. I have provided the Panel and Hydro counsel with copies as well. If the intervenors need copies they are sitting here at the table.

THE REGISTRAR: That will be Exhibit 686, Mr. Chairman.

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 686: A compilation of Mr. R. Watson's cross-examination materials.

CROSS-EXAMINATION BY MR. R. WATSON:

Q. Panel, just one quick question of clarification before we start. If you could refer to Exhibit 646, the graphs at page C1-7, there are no units for the vertical axis. I assumed those units are terawatthours; is that correct?

MR. DALZIEL: A. That's correct.

Q. And that would be the same for all similar graphs throughout Exhibit 646?

A. I would want to do a quick check, but I would expect that is right.

Q. For instance, the graph B3 at figure C-27?

A. That's correct.

Q. Thank you. Panel, I would like to start by dealing with the issue of life extension, and perhaps these questions will be dealt with by Mr.

Snelson or Mr. Shalaby.

I understand that for planning purposes Hydro is now assuming a life extension of at least 10 years; is that fair?

MR. SHALABY: A. That's correct.

Q. And when we were here before in Panel 8 dealing with life extension at that time Hydro indicated that there were no studies on life extension. That was dealt with in their Interrogatory 2.6.16 which is found at page 2 of my materials.

Mr. Chairman, that was given a number of 475.14 at the time. That interrogatory was filed in Panel 8. I understand that now Hydro has produced Interrogatory 8.9.119, which provides some rationale for the decision and some economic analysis.

My question is: Are there any other studies aside from what we found in 8.9.119?

THE REGISTRAR: 8.9.119 should be given 683.7.

---EXHIBIT NO. 683.7: Interrogatory No. 8.9.119.

THE CHAIRMAN: Maybe we should give 2.6.16 a Panel 10 number as well.

MR. R. WATSON: Certainly.

THE CHAIRMAN: People are going to be looking at these and see what interrogatories were

referred to in that Panel, and so would you give --

THE REGISTRAR: 2.6.16 becomes .8.

---EXHIBIT NO. 683.8: Interrogatory No. 2.6.16.

MRS. FORMUSA: Sorry to interrupt. Mr. Watson said that 8.9.118 had been given...?

THE CHAIRMAN: 119.

MR. R. WATSON: I was dealing with 119, Mrs. Formusa.

MRS. FORMUSA: No, I realize that, but you had said that it had previously been used in Panel 8. So has 8.9.119. It has a 475 number as well. So I don't know if you want to maintain consistency or give it a Panel 10 number.

THE CHAIRMAN: They are going to have both numbers. This is Mr. Howard's proposal, and we have to live with it since Panel 3 so...

MRS. FORMUSA: So 8.9.118 will also have...?

THE REGISTRAR: 8.9.118 is .9.

---EXHIBIT NO. 683.9: Interrogatory No. 8.9.118.

MRS. FORMUSA: Thank you.

MR. SHALABY: The answer to your question is no. If you can remember your question you would be pretty good.

MR. R. WATSON: Q. I can, Mr. Shalaby.

Thank you.

Just so that everyone else remembers it, the question was: Are there any other studies aside from what is in 8.9.119, and you are telling me that there are not?

MR. SHALABY: A. This is the extent of economic studies on the life extension.

Q. Now, if you could turn with me, Mr. Shalaby, to page 4 of my material, this is the study we are talking about. It is entitled: A Working Paper: Life Extension of Existing Fossil Stations.

And we see in the first paragraph that this working paper summarizes the evaluations with respect to life extensions of Lambton and Nanticoke which were carried out late in '91 and early in '92 and goes on in that paragraph at the end to say: Later work refined the early work and resulted in this summary.

A. For the record, Mr. Watson, I just want to alert people that what you have included here is not the complete response to the interrogatory. Am I correct in that? There are tables as well as the graphs that you have shown. You may not refer to them. I just want to be clear that there are other things in the interrogatory response that are not here.

Q. That's correct, Mr. Shalaby. There are a page of tables, and those tables give the figures from which the graphs were created.

A. That's correct.

Q. Graphs 1, 2, 3 and 4.

A. Yes.

Q. There is no extra information in those tables that isn't in those graphs, I think.

A. You are probably right, yes.

Q. Yes.

A. That just proves how lousy a graph reader I am. So I am now prepared to read tables and graphs.

Q. Now, as I was saying, Mr. Shalaby, at the end of this paragraph, it indicates that later work refined the earlier work and resulted in this summary. I was wondering if you could produce the actual calculations as opposed to just the summary.

A. There are spreadsheets, computer spreadsheets, I would suspect, that would back up these numbers. Is that what you are interested in?

Q. Yes, the data backing up this analysis. Instead of getting just the summary could we actually get the analysis that was done?

A. I can take a look and see what is

available, yes.

MR. R. WATSON: Thank you. Could we have an undertaking number for that, Mr. Chairman?

THE REGISTRAR: 684.10.

---UNDERTAKING NO. 684.10: Ontario Hydro undertakes to provide backup analysis for A Working Paper: Life Extension of Existing Fossil Stations.

MR. R. WATSON: Q. Mr. Shalaby, if we keep on --

MR. SHALABY: A. Now, to be specific, then, you would like the data that would back up, for example, figure 2 or 3 or?

I don't want to give you a choice, but maybe one would be representative of all of them? I think doing all the graphs could be just too much. Would one satisfy you?

Q. I'm not sure I can answer that question right now, Mr. Shalaby, without knowing what they are. Why don't we --

A. Could we start with one and --

Q. Why don't we work with the Nanticoke calculations right now and see how it goes?

A. All right.

Q. And if that isn't sufficient, we will come back.

A. Okay.

Q. Now, if you look at the second page of this study, Mr. Shalaby, it is page 5 of Exhibit 686, looking down at part 2 which is entitled: Economic Analysis, if we could look down at the fifth paragraph, the one that starts with the words "In the case of Nanticoke..." we see that all environmental control equipment is attributable to the life extension decision. They are talking about scrubbers, SCRs and particulate control.

As you pointed out, Mr. Shalaby, there are some graphs associated with this, and if you could turn to page 8 of figure 3, and on figure 3 we see the graph comparing the LUECs of the 10-year life extension versus IGCC or combined cycle, and there is virtually no difference in the cost, and, in fact, Hydro refers to the comparison as "extremely marginal"; is that fair?

A. Yes.

Q. And that conclusion by Hydro is found on page 6 of Exhibit 686 at the top of the page, the second sentence: Under the above assumptions a 10-year extension appears extremely marginal and a 30-year extension appears economic.

Now, Mr. Shalaby, if we turn to page 7 we

see the Lambton comparisons. We see there that the Lambton comparison is less economically unattractive than the Nanticoke comparison for the 10-year life extension.

If I could refer you back to page 5 under part 2, if you would look at the fourth paragraph dealing with Lambton, in doing this analysis different assumptions were made for Lambton than for Nanticoke; isn't that fair?

A. Yes.

Q. And in particular, for Lambton it was assumed that the scrubbers and the combustion process modifications are not charged to life extension?

A. Yes.

Q. And it is further assumed that only the SCRs and the particulate controls would be charged to life extension?

A. Yes.

Q. And, Mr. Shalaby, I take it it is fair to say that if Lambton had been treated like Nanticoke, the same assumptions had been made, it would make Lambton appear less economic with respect to life extension; isn't that fair?

A. If the mechanical calculations were followed, your conclusion is correct.

But the assumptions bear some relation to what is actually happening. There are two scrubbers under construction right now at Lambton, and those were committed and under construction before the decision to life extend was made.

So I think that analysis relates to the actual circumstances that Lambton is going through.

Q. But that just deals with two scrubbers.

A. Yes.

Q. There are four units at Lambton?

A. That's correct.

Q. So there are two other scrubbers up for consideration as well as the combustion process modifications?

A. Yes. And those two other scrubbers were in Hydro's plans and will be considered for Lambton in the near future. Again, it was felt that it could be analyzed as a commitment independent of life extension.

Q. And, Mr. Shalaby, you recall both those figures, figure 1 and figure 3, are comparisons to IGCC or combined-cycle units?

A. Yes.

Q. And would you agree with me that in

looking at the LUECs of those two options they are not the least costly options as far as major supply options are concerned; is that fair?

A. For some of the capacity factors, for example, at the 20 per cent capacity factor, combined cycle is pretty close to being the lowest cost.

Q. Certainly isn't at 40 per cent and it certainly isn't -- neither of those are the cheapest at 40 per cent or at 60 per cent?

A. Let's look at a table that you have here, a perfect introduction to your page 9, I think.

Q. Yes, that is exactly it. I was hoping you would just say yes, and we wouldn't have to go through the table, Mr. Shalaby.

A. I think they may not be the least expensive, but they are not far from being comparable to the least expensive options in that capacity range.

Q. Well, the 4 by 881 CANDU is 3.6 cents?

A. Yes. The comparison doesn't extend to the 80 per cent capacity factor.

Q. Okay.

A. We are trying to compare what Lambton and Nanticoke would be replaced with, and Lambton and Nanticoke are expected to operate in the intermediate

operation, 40 per cent plus or minus. So the comparison was options that would operate in the 40 per cent capacity factor, plus or minus, not to baseload operations.

If you look at 4 by 881 at 40 per cent capacity factor, that is seven cents per kilowatthour, and if you look at IGCC it is also seven cents, and combined cycle miraculously is also seven cents, so...

Q. And coal is 6.1 cents?

A. And coal is 6.1 cents.

Q. And at 60 per cent, your graph -- your figure 3 goes to 60 per cent. Looking at 60 per cent, nuclear and coal options are 4.8 cents?

A. Yes.

Q. And the combined-cycle options at 6.5 cents?

A. And the IGCC is --

Q. And the IGCC is at 5.2 cents?

A. Yes.

Q. And my point is the same, Mr. Shalaby. If in fact you use the lower cost operations at these capacity factors you in effect would end up with a less favourable economic comparison for life extension; isn't that fair?

A. It will not be a meaningful

comparison, in my opinion.

THE CHAIRMAN: Not be a what?

MR. SHALABY: Will not be meaningful to compare the life extension of Lambton to a new nuclear plant. They will not do the same job.

[12:40 p.m.]

The replacement for Lambton is most likely to be something that will operate in the intermediate base, intermediate to high intermediate operation. But again, the mechanics, if you want to put a lower number to compare to, then the economics of life extension will look less favourable, but it's not a meaningful comparison, in my view.

MR. R. WATSON: Q. Currently Nanticoke is operating at close to 80 per cent capacity factor; is it not?

MR. SHALABY: A. That would surprise me. I don't think so.

Q. Could you turn to page 10 of my Exhibit, 686. Mr. Shalaby, that's an excerpt from Exhibit 3, it's figure 4-20 found on page 4-20 of Exhibit 3. If you look at Nanticoke, if you look at the Nanticoke row, you will see under --

A. What we are looking for here --

Q. The capacity factor is 78 per cent.

A. No. I think we corrected that in an errata. The heading on that column that reads average capacity factor, I think was corrected to something like maximum capability, or something to that effect. We are checking that out for you.

The errata is Exhibit 86. The page is page 5, and on top of that page 5 we say in figure 4-20 replace average capacity factor with projected 1993 capability factor.

I regret that we are having to mention the errata too many times in this session, but...

Q. So, Mr. Shalaby, is it your evidence that Nanticoke is currently operating at around 60 per cent or lower capacity factor?

A. I just said I am surprised if it was operating at 80. My guess it would be operating around the 40 per cent plus or minus.

Q. Okay.

A. There is evidence in the hearing and elsewhere. Mr. Dalziel is alerting me to Interrogatory 8.9.145, which is part of your Exhibit 685. That has some information.

I am sorry, it's not part of your exhibit. I apologize. But it's an interrogatory directed to you nonetheless. It's something you

received in March of '92.

What it shows, in a nutshell, in the Demand/Supply Plan Update, Lambton and Nanticoke are operating in the 20 to 40 per cent capacity factor, roughly, depending on the year.

Q. What year is that, Mr. Shalaby?

A. In the year 2014, for example, they are operating at about 44 per cent; in the year 2000 they are operating at 19 per cent for Nanticoke and 36 per cent for Lambton.

THE CHAIRMAN: Perhaps we better record that interrogatory. What interrogatory number is that, Mr. Shalaby.

MR. SHALABY: 8.9.145.

THE REGISTRAR: That will be 683.10.

---EXHIBIT NO. 683.10: Interrogatory No. 8.9.145.

MR. R. WATSON: Q. Okay, Mr. Shalaby, continuing on page 5 of Exhibit 686. Looking at the Nanticoke paragraph again, the fifth paragraph under part 2. That assumes that all of the environmental controls will be installed in the period 2011 to 2013.

If I could refer to you page 11 of Exhibit 686, which is attachment G from Exhibit 646. If you look at the Nanticoke environmental controls, let's start with Nanticoke FGD, under the Update it

appears as though all of the scrubbers will be in place by the year 2005.

And if we go down the chart, you will see that all of the Nanticoke controls appear to be place under either the Update or enhanced plan before the year 2011.

Isn't it fair to say that if these controls are installed earlier then the study costs that we have been looking at will be understated?

A. The answer is yes, and the explanation is that as Panel 8 indicated clearly, while there is a strong connection between life extension and enhanced environmental controls, if the controls are put ahead of the 40th year, then they are providing benefits that are in a way unrelated to life extension. They are providing environmental protection and performance for years before the 40th year of the station service life.

So, the two studies, the study that assumes the environmental controls come very close to the end of the life, the 40 years, attempts to say that if you built these just to life extend here is what the comparison would look like.

Now, the attachment G that you have just referred us to says that if we are going to build them

towards of the end of the life, there are benefits to building them yet before that, but the costs of building them before that was not felt to be charged to life extension. It's charged to better environmental performance for years ahead of that.

Q. But, Mr. Shalaby, certainly Hydro's position is they cannot life extend without these controls?

A. Yes.

Q. And this same conclusion about advancing the time for controls applies to not just the scrubbers we looked at, but all of the controls that are mentioned?

A. Yes.

Q. Now, Mr. Shalaby, what I would like you or whoever did that analysis to do is to rework those numbers, if you could. If you could: 1, compare the life extension option to the lower cost options; 2, if you could use the appropriate in-service assumptions for both the Update and the update enhanced plan, and 3, if you could use the same Lambton assumptions as you used for Nanticoke.

A. Use for Lambton what we used for Nanticoke?

Q. Yes.

A. Meaning increase the costs of life extension to the maximum possible, is that what you want us to do?

Q. I mean use a level playing field.

THE CHAIRMAN: That is one way of putting it. He wants you to apply the whole cost of life extensions.

MR. SHALABY: Yes, we can do that.

And my reason for missing the tables is that we could have gleaned some of that information from the tables that are not reproduced here. It shows the costs of the scrubbers. For example, at Lambton you could have added two cents per kilowatthour, whatever it is the cost. It could have given us some of those answers, if you like.

MR. R. WATSON: Q. We can get a rough estimate, but I think it would be much more valuable to have this study redone.

THE CHAIRMAN: What is all this leading towards? Perhaps could you help me a bit, why do we need this information?

MR. R. WATSON: Why we need it, Mr. Chairman, is so we can simply have some idea of what sort of economic decisions we should be making in this planning exercise.

Life extension is clearly a major part of the new plan. It's 4,300 megawatts and we need to know what it costs.

As we saw yesterday with Exhibit 452D, there was a concern about a level playing field, there is a similar concern here about a level playing field with respect to life extension.

THE CHAIRMAN: But the evidence is they that are going to put this control equipment into, I think it is Lambton, I get them mixed up, in any event, no matter whether it's life extension or no life extension; isn't that correct?

MR. SHALABY: The two decisions are linked, Mr. Chairman. Once the environmental controls are installed it makes sense to life extend and it doesn't make sense to life extend without the environmental controls. I think we explained that circular argument in Panel 8, and it continues to be two pieces of the same decision. They are interlinked to each other.

MR. R. WATSON: That's exactly the point, Mr. Chairman, because they are interlinked we are in a situation where if we are not making a good, sound decision now, we could have a large number of sunk costs up front quickly and we would then be in a

position where we can't change our mind, and it is that very linkage between those two which makes that decision so significant.

THE CHAIRMAN: You are prepared to provide that information?

MR. SHALABY: I am. We are not going to be very popular people back in the office today. We are taking far too many undertakings.

The calculation we will provide will be interpreted subject to the limitations I indicated here on the stand, that some of them we don't feel are very meaningful interpretations. So we will do the mechanics but we will state in there what concerns we have with interpreting these numbers.

THE CHAIRMAN: 684.10, is it?

THE REGISTRAR: No, 11 now, Mr. Chairman.

---UNDERTAKING NO. 684.11: Ontario Hydro undertakes to provide recalculation of costs of Nanticoke life extension.

MR. R. WATSON: Q. Mr. Shalaby, this study is talking about the cost of life extension, and it is fair to say there are two types of costs, there is the costs of maintaining the existing units up to 40 years, and as you have indicated before, there is the cost of environmental controls as well. There are both of those costs?

MR. SHALABY: A. Yes.

Q. And both of those are important to the life extension decision, there is that linkage of which you spoke?

A. Yes.

Q. Now, I would just like to look briefly at the first item of costs, the costs of maintaining the existing units in operation for longer than 40 years. If we could just use Lambton as an example.

A. Yes, go ahead.

Q. Lambton is approximately 20 years old, I think we can assume it will have another 20 and assuming that we can expect at least 10 years of life extension. Let's deal with 30 years as round figure for Lambton's life. Are you with me?

A. I'm with you.

Q. Now, we know from the second paragraph on page 5 of 686 what Hydro is estimating the costs will be of maintaining these units in operation, and there are two components to that. The first component is dealt with in the second sentence where you are talking about the incremental capital expenditures per unit of the order of $3 million per year beginning in the 40th year of station life. And

the quick calculation there, Mr. Shalaby, of course, is that if they are four units at Lambton, $3 million per unit for 10 years, that's about $120 million; is that fair?

A. Yes.

Q. The sentence goes on to talk about incremental OM&A expenditures of 7.5 per cent and variable costs starting immediately.

What I did, Mr. Shalaby, was look at you are interrogatory answer, 8.9.122, which is at page 12 of my material.

THE REGISTRAR: 8.9.122 is.11.

---EXHIBIT NO. 683.11: Interrogatory No. 8.9.122.

MR. R. WATSON: Q. And we can see there, Mr. Shalaby, perhaps we could take a proxy from Nanticoke in the third paragraph, Nanticoke at 60 per cent capacity factor would require $3 to $5 million for OM&A.

THE CHAIRMAN: Sorry, I am lost again.

MR. R. WATSON: You are on page 129 of Exhibit 686, Mr. Chairman?

THE CHAIRMAN: Whereabouts?

MR. R. WATSON: The third paragraph.

THE CHAIRMAN: The third paragraph, all right.

MR. R. WATSON: Looking at the second sentence talking about information on Nanticoke. It says for a 60 per cent capacity factor, this would be $3 to $5 million per station. That's in the context of OM&A estimates.

THE CHAIRMAN: Yes.

MR. R. WATSON: Q. So, Mr. Shalaby, if we could take that as a rough figure, say $4 million for Nanticoke, Lambton is half the size of Nanticoke. If we are assuming, say, $2 million per year over 30 years, that would be an extra $60 million roughly?

MR. SHALABY: A. Yes.

Q. So that gives us a total of $180 million when you are dealing with the two items mentioned in that sentence on page 5 of the study, page 5 of Exhibit --

A. I don't know if my head it buzzing or not, but the first figure you mentioned is 120?

Q. Yes. And the next was 60.

A. But the first was over a 10-year period, is that correct, and the second over a 30-year period?

Q. That's right.

A. And do you intend to add a 10-year figure to a 30-year figure?

Q. Yes. Roughly, just to get a rough estimate, Mr. Shalaby, and the reason I am doing that is if you look at the study on page 5, you can see that the capital costs are not to start until after the 40th year of the life.

A. Okay, So this is a 10-year life extension you are talking about.

Q. That's right.

A. All right.

Q. So that deals with the capital expenditures and the OM&A expenditures in that sentence on page 5. Are you with me?

A. Yes.

Q. In fairness, the last sentence says:

> These costs are small in comparison to the substantial amounts currently provided for life management at Nanticoke and rehabilitation at Lambton.

Now, dealing with the life management figures, and as I understand Hydro's philosophy of life extension, Mr. Shalaby, it's not sufficient just to look at life extension, but you have to add in the life management costs; is that fair?

A. Yes.

Q. And we know from, I believe, Panel 2

that Hydro was planning on spending about $20 million a year on Nanticoke for life management. Do you recall that?

A. Not exactly, but I will accept that for the purpose of this discussion, yes.

Q. Okay. Mr. Shalaby, just for the record, it's at Volume 16, page 2862.

A. Are you expecting me to remember that?

Q. No. But no doubt you will check that at the break and if I have said something incorrect you will let me know.

Assuming Lambton is again have the size of Nanticoke, that would give us about $10 million a year. And that, over 30 years, would be about $300 million.

So that gives us a total of approximately $480 million?

A. Go again over the last item, the last item 10 million over 30 years?

Q. The last item was the life management of Lambton, we are dealing with the Lambton costs, and if Nanticoke is 20 million, I am asking you to make the assumption that Nanticoke would be about half of that, about $10 million, and over 30 years of life management

that would be about $300 million.

A. I am concerned there may be a bit of double counting in the OM&A that added up to 60 million dollars and the new 300 that you are producing.

Q. So this figure of 480 would be a maximum figure then, because there may be some double counting there.

A. Depending on what you want to do with it, let's proceed on that basis.

[1:03 p.m.]

MR. R. WATSON: Okay. Mr. Chairman, I have set up one part of the comparison. I was going to deal with the other. I notice it is just after one o'clock. Would you like to take the break now?

THE CHAIRMAN: We will adjourn until 2:30. Hold it just a moment.

MRS. FORMUSA: I'm sorry to eat up time into the lunch hour, but I have a submission to make with respect to the direction in which this cross-examination is going.

I haven't stood up until this point, but it appears to me at least that in terms of the life extension issue it was my understanding that that had been reviewed with Panel 8 with the experts who were there to speak to it.

I recognize that Mr. Watson might be coming to his point with respect to the planning issues for the Update, but I am not clear that in visiting this issue in detail with respect to its costs is particularly pertinent to this panel and that we have the expertise on the panel to deal with it.

I wanted to make that submission now, having listened to the last few minutes of cross-examination.

THE CHAIRMAN: We will take your submission and we will deal with Mr. Watson's reply at 2:30.

MRS. FORMUSA: Thank you.

THE REGISTRAR: This hearing will adjourn until 2:30.

---Luncheon recess at 1:05 p.m.

---On resuming at 2:37 a.m.

THE REGISTRAR: Please come to order. This hearing is again in session. Be seated, please.

MR. R. WATSON: Mr. Chairman, if I could respond to Mrs. Formusa's objection, I started out by referring you to Interrogatory 2.6.16. That was on page 2 of my exhibit package. You will note that interrogatory is dated March 5, 1991. That interrogatory indicated that there were no studies

regarding life extension.

If you turn the page to page 3 you will see Interrogatory 8.9.119. That is the interrogatory which provided the study that I was examining on this morning. You will note that the date of that interrogatory is March 17th, 1992.

I believe, if you recall the dates of the hearing, we finished Panel 8 before March 17th, 1992 so there was no opportunity to examine on this study in Panel 8.

Also, if you look at the date on page 4 of Exhibit 686 you will see that this working paper is dated February 7th, 1992. So it was created in time; it just wasn't produced in time.

The simple point is, Mr. Chairman, this is the only opportunity we have had to deal with this.

THE CHAIRMAN: It is entitled: A Working Paper, I notice.

MR. R. WATSON: Yes.

THE CHAIRMAN: I think the greater difficulty, is it not, is that this panel here doesn't have the knowledge that Panel 8 had about the fine tuning, if I can put it that way, of the life extensions on Lambton and Nanticoke, and so it may be fine that this is a later document, but they just don't

have the information to give to you. They are not here to give that kind of information.

MR. R. WATSON: Well, I appreciate the fact, Mr. Chairman, that they certainly wouldn't have the indepth technical details that the people in Panel 8 would have, but that is not what we are cross-examining on. We are dealing with large cost estimates which Hydro uses as inputs to their planning exercise.

THE CHAIRMAN: But Panel 8 was extensively cross-examined on the way they did their costing, and how they did it, and what their methodology was, and so on, and so on, even by you; I think it was you that did it for your client. But there was a lot of cross-examination in Panel 8 about all these matters that have been raised this morning.

Granted, this particular information wasn't consolidated the way it is here, but there was quite a bit of information given.

I mean, how far do we have to go, is I guess what I am asking myself. There has to be a limit somewhere where we have got all the information that we can usefully use.

MR. R. WATSON: Well, if I can assist you, Mr. Chairman, I don't plan on being much longer on this issue of life extension.

As I was indicating this morning, I have gone through the costs that Hydro outlines in their working paper which they produced for us, the OM&A costs, the capital costs and the life management costs.

My client's concern is that those costs are simply insufficient to keep these units going; Hydro has simply underestimated the costs of life extension.

If I could refer the Panel to another interrogatory - I assume it will take about five minutes - I would like to demonstrate that point, and that would in effect complete the circle. It would allow my client to have the opportunity of the latest information from Hydro, contrasted with the information provided in Panel 8, and then we would have the cost figures that we could then use to critique Hydro's costing estimates for the planning exercise.

As Mr. Shalaby said, that is the first point.

The second point, Mr. Chairman, is exactly what Mr. Shalaby was saying this morning, that there is a link between the life extension costs and the environmental costs, and only by knowing what these environmental costs are in the planning exercise can you get a handle and get some understanding of the

overall costs for the planning exercise: is it useful, is it meaningful to life extend these units in light of this information?

That is my client's concern, Mr. Chairman.

THE CHAIRMAN: What is the next interrogatory you want to refer to?

MR. R. WATSON: It is 8.9.54, and that was in evidence before, Mr. Chairman, as 475.6. It is at page 13 of Exhibit 686.

Perhaps we should have a 683 number for it?

THE CHAIRMAN: All right.

THE REGISTRAR: That will be .12.

---EXHIBIT NO. 683.12: Interrogatory No. 8.9.54.

THE CHAIRMAN: But now, it was available for use in cross-examination on Panel 8.

MR. R. WATSON: It certainly was, Mr. Chairman. And as I indicated to you in my submissions, what I would like to do is now very briefly take this and contrast it with the numbers that came out of the planning study that we dealt with just before lunch.

THE CHAIRMAN: All right.

I take it, Mrs. Formusa, you are not asking to scrub the undertakings that have already been

given; is that correct?

MRS. FORMUSA: That's correct, Mr. Chairman.

THE CHAIRMAN: Then I guess the expeditious way of going about it is to let you proceed.

MR. R. WATSON: Thank you, Mr. Chairman. I will be brief.

THE CHAIRMAN: It may not be the right way, but it is the expeditious way.

MR. R. WATSON: Q. Mr. Shalaby, if we could continue from where we left off this morning, just to put it in perspective we talked about the capital expenditure costs, we talked about the OM&A costs, and we talked about the life management costs for Lambton, and we arrived at a figure of approximately $480 million, and I think we all appreciate that is not a precise figure. You indicated there might be some double counting in that figure.

Perhaps what I would like to do is move on to Interrogatory 8.9.54. That provides the cost estimate with respect to rehabilitation of Lambton, and, as you can see, the estimate was $1,150 million, and it was subsequently reduced to $805 million because the work scope was reduced, as indicated in the

interrogatory.

Now, just to get some handle on the cost, Mr. Shalaby, Lambton operated for about 20 years, and it, according to this estimate, looked as though it needed about $1,150 million.

Using a similar sort of analysis just to get a rough estimate, if it goes another 30 years using the figure of $1,150 million, multiplying it by 30 over 20 we would arrive at a figure of around $1,700 million for a subsequent rehabilitation.

Are you with me?

MR. SHALABY: A. Yes, I am. I was taught to answer only when there is a question. So there wasn't one, so...

Q. Okay, Mr. Shalaby. My client's concern -- [Laughter]

Counsel taught you well, Mr. Shalaby.

A. Yes.

Q. My client's concern, Mr. Shalaby, is as I indicated to the Chairman in my submissions, that comparing the $500 million to $1,700 million seems to indicate that what you are anticipating for life extension is just not sufficient.

A. There are two points I would like to make on that.

One is that life management is Hydro's way of not repeating the massive costs that are incurred at Lakeview and Lambton.

What has happened at Lakeview, and to some extent at Lambton, is we are now convinced the way not to do things. You don't let the machines deteriorate to a stage where you overhaul them in a big way like this. So it is a different strategy that says: spend continuously and you are better off doing the maintenance and the life management continuously than to let the machines deteriorate and then do an overhaul job like we are doing now.

So we think that is a smarter way of managing the assets, the fossil-generating assets.

So that is point No. 1. By definition we think this is a better way, and therefore, it is a cheaper way.

Point No. 2 in the analysis is that in the life extension memo at page 5 in your exhibit, there is a sensitivity study included in that memo. On page 5 under part 2, the second paragraph there, and the last sentence of that second paragraph reads: As a sensitivity, these cost estimates - this is now the OM&A and capital associated with life extension - are doubled in this analysis.

So we appreciate the point that our cost estimates for life extension and life management are uncertain, and to show what the costs would be even if these costs were doubled we have doubled those costs. So your 500 million, if we accept the arithmetic, could be a billion dollars in the analysis here to show what if the costs were truly underestimated by a half.

So we recognize the uncertainty, but we also recognize that life management is a cheaper way of managing the asset than to leave it to deteriorate and then rehab.

Q. Mr. Shalaby, if I could deal with your second point first, we were talking about capital expenses, OM&A and life management.

You recall the first two amounted to about $180 million, and that paragraph that you were just referring to said as a sensitivity these cost estimates are doubled, that "these" refers to just the capital and the OM&A, so the $500 million figure would in effect be closer to 700 million as opposed to a billion which -- and a concern then is--

A. Yes.

Q. --exactly the same. It is 700 million versus 1.7 billion.

A. My second point could explain that

differential there.

Q. Your first point?

A. My first point.

Q. Okay.

A. About it is a better strategy or perceived to be a better strategy to manage the assets.

Q. And my response to that, my concern with respect to that, Mr. Shalaby, is that the difference in the figures seems to be so phenomenal. Your life management costs are $300 million versus the 1.7 billion.

Do you have any analysis or any studies which would give my client some comfort that $300 million spent over time is going to be the equivalent of $1.7 billion spent on a rehab program or that it will prevent a 1.7 billion rehab?

MR. SNELSON: A. Mr. Watson, I am having a bit of difficulty with this grossing-up the number from 1.1 billion to 1.7 billion because it seems to me the logic for that that you have given is, that is a cost of operating the plant for 30 years, and the life extension evaluation is for a shorter period of life extension; is it not?

Q. The life extension is 10 years, Mr. Snelson, but we have to run 20 years to get to that

10-year period.

A. But running those 20 years is common to whether we retire the plants in 2010 or life extend them to 2020.

Q. That is correct, Mr. Snelson. But we still have to pay those costs, and if in fact you are incorrect in your assumption that you can spend this amount on life management at the end of the day you are going to need a large amount on rehab.

And the simple point is: You haven't done the analysis to examine that, have you?

A. I only have one point here, and that is, the costs that you have identified were intended to be the costs that are attributable to extending the life for 10 years, and that you are comparing it to a cost that is for operating a plant for 30 years. And I think that kind of makes it a bit of an apples and oranges comparison.

Q. Mr. Snelson, the point is really quite simple. If your estimate of $10 million a year on life management is insufficient to keep the unit in the condition it needs to be so it can be life extended you are going to have to do a rehabilitation if you want to life extend that unit; you are going to have to put more money into it up and beyond that, aren't you?

A. I don't think that we are questioning that there are uncertainties in our estimates. I am just cautioning that we shouldn't be comparing the costs based on a 30-year extension with the costs that were intended to cover a 10-year extension.

Q. And, Mr. Snelson or Mr. Shalaby, if you have to spend that extra money, you haven't done any analysis to determine where you are, you haven't done any analysis to determine whether this new change in philosophy with respect to life management is effective. That's fair, isn't it, Mr. Shalaby; you just haven't done the analysis?

MR. SHALABY: A. Well, I want to come back to the simplistic analysis we are going through now, and that is to pick up the life management costs and the two other categories that you picked up.

I think much of the OM&A that is spent on the station contributes to keeping the station in good shape as well, and the rehab that is being done would bring the station to a level of performance that spending some money on it in every year would keep it in good shape.

I think these two work together. It is not one or the other.

You rehab the station; it is going to be

in excellent condition with it's 'rehab'ed; it is easy to maintain it after that if you spend a bit of maintenance money. That is what this strategy is indicating.

I am not in a position to tell you whether that expenditure is sufficient for 30 years or not. I think I will have to refer to Panel 8 testimony on that.

Q. But the simple point is: You haven't done the analysis.

A. Panel 8 gave a lot of evidence on the reasons for their confidence in life extension with this kind of expenditure: the status of the equipment, the inspections that they have done at Lakeview and at Lambton, and the experience of other utilities.

Q. My question, Mr. Shalaby, is quite specific. With respect to this change in philosophy that you were talking about, that life management is going to keep the units in the appropriate condition, there is no study with respect to that, is there.

A. I don't know that. I have got to go and look at the interrogatories and transcript undertakings and ask my colleagues.

Q. Okay, Mr. Shalaby.

A. I don't know off hand of a study on

that specific point.

MR. R. WATSON: Perhaps, Mr. Chairman, we can just have an undertaking number, and if there is some study it would be produced?

THE CHAIRMAN: I am not quite sure what the study would be.

I hope I am not confusing it.

Mr. Snelson's point seems to be that these expenditures, at least a certain substantial of among them, would be expended in any event, and, therefore, to value the life extension you really should look at the 10-year period. Is that what you were saying?

MR. SNELSON: Yes, essentially that the costs of keeping the station operational and in good condition between now and its normal retirement date is common to whether or not you are going to extend the life for 10 years.

THE CHAIRMAN: Whereas, Mr. Watson seems to be saying if you embarked today on a decision to extend the life, therefore everything you spend to achieve that goal should be taken into account, that seems to be the difference.

MR. R. WATSON: Well, with respect, Mr. Chairman, I don't think it is exactly that.

THE CHAIRMAN: That may not be. That is what I understood Mr. Snelson to be saying. Am I correct in that?

MR. SNELSON: I think it was intaking a rehabilitation cost that was incurred after 20 years' life, which is I think the line of reasoning that you were using--

MR. R. WATSON: Yes.

MR. SNELSON: --and then saying, but they are going to have 30 years' more life, and therefore, it should be -- for the rehabilitation part of the cost it should be 1-1/2 times the 20-year rehabilitation cost.

And I am having difficulty with that particular piece of logic for that reason on that element of cost, because the operation over the next 20 years is common to whether or not you life extend, and you are really looking at the cost of extending for a further 10 years.

MR. R. WATSON: Q. Mr. Snelson, just dealing with that point, there are two concerns there. One is contrasting your life management with your rehabilitation.

[2:55 p.m.]

If you didn't do the life management, you

did all the rehab you thought you were going to do, brought the unit up to scratch, if you then engaged in the same philosophy and ran it down, we would have a rough proxy perhaps as to how much it would cost 30 years from now, and that rough proxy is 1-1/2 times what it cost after 20 years.

MR. SHALABY: A. My recollection of the -- fixing up the coal yard, for example, whether it ran for 20 or 30 years, I don't think the relationship follows.

There are things that deteriorate not exactly as a function of time. We mentioned operating hours and we mentioned other things.

Q. No question, Mr. Shalaby. It's simply a proxy for a very large sum of money which is larger than what you incurred after the 20 years of option. It's simply designed to show that there is a considerable difference between what you were planning on spending in life management, which is your current philosophy, versus your old philosophy which was to do a rehab after a certain number of years.

My client's concern is that because that differential is so large, you may not be spending enough on your life management programs and on your other programs to achieve the results you want to

achieve. And that's the point of my question, did you do an analysis for this new philosophy of having life management? Where is my client's comfort that this is going to be sufficient and that this other figure is not going to be the reality?

A. I think we have shown that even if we spend more than what we are estimating -- I think we all have to acknowledge that those estimates have uncertainty associated with them. There could be larger expenditures than what we are showing today. But we are convinced that that is a better route to take today than to let the equipment deteriorate and then rehab.

Q. Just finishing up on that, Mr. Shalaby, we were talking about rehabilitation, bringing the units up to scratch. We know from Interrogatory 8.9.54 that you are aren't bringing the units up to scratch. We know that the initial estimate was $1,150 million and you are only doing $805 million worth of work. So there is approximately $345 million worth of work not being done.

A. Yes.

Q. So that is a further factor that gets thrown into the analysis, the life management program is going to have to deal with that situation as well.

In effect, it's starting beyond the 8 ball a little bit; isn't it?

A. Behind what the situation would have been if we spent more money, yes.

Q. And what I hear you saying is there really are no studies comparing these two philosophies and this last point indicates that there are going to be more uncertainties associated with this life management scheme because of the fact --

A. I think we have transcript undertakings that provided you with the EPRI studies, for example, that we relied on in reaching these conclusions, and I have just got the undertakings here. I think it is 478.5 and 6, I think. Let me take a look. No.

They are undertakings to you, most of them.

There was an undertaking that says provide the basis for the increased confidence in life extension, and we indicated the utilities that we spoke to and we indicated the studies that EPRI, the Electric Power Research Institute, has conducted and we relied on those kind of studies.

Q. But that doesn't deal with this specific concern about Lambton and the change in

philosophy between life management and the rehabilitation costs, the fact that there is such a huge discrepancy between those two figures.

A. That's the reason we chose the second strategy. It is a smarter way of managing the asset.

Q. You believe.

A. Yes.

Q. And the studies you have are the ones you have just referred to, they are the only ones that help.

A. Well, I have an undertaking to see if there are anymore, but those are the ones I am aware of.

MR. R. WATSON: I think we could get an undertaking number for that, Mr. Chairman.

THE CHAIRMAN: 684.12.

MR. SNELSON: I think some of us are having a bit of trouble from this discussion distilling what the undertaking was supposed to be. I don't know whether Mr. Shalaby is clear on it but I'm not.

THE CHAIRMAN: Mr. Shalaby, you referred to an undertaking a few minutes ago, you were referring to undertakings already given or the subject matter we were just discussing?

MR. SHALABY: I was also attempting to

refer back to a Panel 8 undertaking that lists the reasons for our increased confidence in life management, but I can't find it right away. I think this is the one you are referring to.

MR. SNELSON: No, I am referring to the undertaking that has just been given now of 684.12, and that we should know what it is we are undertaking to do.

MR. R. WATSON: Q. Very simply that is whether there are any studies looking at the economic comparisons between the amount of money you are spending on life management for Lambton, an amount that could possibly be needed for rehabilitation, that has been spent on rehabilitation already, and if there any, I would appreciate it if you could provide those.

MR. SNELSON: A. I'm sorry, but this is a study on comparing life management with the expenditures that have been made on rehabilitation? This is water under the bridge. This is things that are passed.

Q. Mr. Snelson, I assume someone made a decision sometime that you were going to change your philosophy from rehabilitation to life management.

A. Yes.

Q. Now in making that decision, were

there any studies, and if there were any studies, I would like to see them?

A. So this really then relates to possible future rehabilitation for Lambton?

Q. I hope that in rehabilitating Lambton and putting over a billion dollars into it, that some consideration was given at that time as well. But you are right, most of it would deal with future.

A. I think that the point here is that at the time in which you say needs to be rehabilitated, then at that point in time life management in terms of doing the jobs as and when the problems arise is no longer an option because you have -- they have built up to the point where rehabilitation is necessary. But for the future, yes, that is correct, that people are addressing that type of question.

Q. Well, Mr. Snelson, whatever studies there are, I would like to see.

---UNDERTAKING NO. 684.12: Ontario Hydro undertakes to provide studies comparing life management and rehabilitation costs.

MR. R. WATSON: Q. Mr. Snelson, or Mr. Shalaby, my last point with respect to life extension is my client is very concerned about the amount of money that Hydro is spending not only on the life extension of these units, but also the environmental

controls that are going into them. And, Mr. Shalaby, you indicated to the Board this morning that there is a link between those costs, isn't there.

MR. SHALABY: A. Yes.

Q. And it's fair to say that the more you spend on these costs in the short-term, the higher you are sunk costs are, the more difficult it is to turn away from a decision such as that; is that fair?

A. Generally, yes.

Q. And we are talking about anticipating environmental regulations, the more environmental controls that are put on these units the more difficult it's going to be to argue that these units should not be continued in operation and the more cost-effective it is going to seem to put the controls on as opposed to say building a new station?

A. Is that the same point you asked before, that the more investment you make in the plant, the less the marginal costs, the more attractive it is to keep running it?

Q. Yes,

A. Yes. I like to say it in that light more difficult. It will be easier to justify running it longer.

Q. Panel, if you could turn to Exhibit

646, page C1-3. This is the output from LMSTM run for the update nuclear, median case managed surplus plus. And we know that there is a similar LMSTM output for each of the six cases in Exhibit 646.

I notice each of these cases was run with life extension assumed for Lambton and Nanticoke; is that fair?

A. That's correct.

Q. And there were no runs done without life extension assumed?

A. Not in that exhibit. But one of the planning questions that Mr. Dalziel talked about was the merits of life extension. So there were runs at that time, I presume that had lesser life and longer life.

Q. Is that correct, Mr. Dalziel that were LMSTM runs done without life extension included?

MR. DALZIEL: A. Yes.

Q. Have they been provided to the intervenors?

A. No.

Q. Could we see those runs, please, Mr. Dalziel? Could you provide them for us?

A. Which ones?

Q. The ones that were done without life

extension.

A. Well, there were several that were done without life extension. As I mentioned earlier, we had the six planning questions that were formulated, one of those looked at including life extensions.

Q. Could we see the runs that were done without life extension, please?

A. I am just wondering if you want them for all of them or if you want them, for example, to the one that used --

Q. Why don't we just do it for the ones that are in 646, or if there is one run without life extension that corresponds to one of the runs in 646.

A. What probably would be appropriate would be to consider the one that was closest to the form of the plan that included life extensions, and then a very similar plan without the life extensions. So that would be two cases.

Q. That is fine.

A. Okay.

Q. We would prefer identical cases with the only variable being life extension?

A. That was my intent, to focus in on that comparison rather than all of them.

Q. Thank you.

THE CHAIRMAN: Do we need a number for that? 684.13.

THE REGISTRAR: .13.

---UNDERTAKING NO. 684.13: Ontario Hydro undertakes to provide LMSTM runs done with and without life extension.

MR. R. WATSON: Q. Mr. Dalziel, in looking at this same table I had a concern last night, if you look at Lakeview 3 and 4, they are assumed to retire, I believe, in 1993, in this run on page C1-3; is that fair?

THE CHAIRMAN: You are going to have to help me. Where is Lakeview 3 and 4?

MR. R. WATSON: Mr. Chairman, if you look in the left-hand column, if you look almost all the way done the second --

THE CHAIRMAN: Yes, I see it now.

MR. R. WATSON: It says units retired, and if you go across it says Lake 3 and Lake 4.

THE CHAIRMAN: I have got it.

MR. WATSON: Q. Mr. Dalziel, these units are retired in 1993 in this particular scenario?

MR. DALZIEL: A. 1994. Numbers are printed on the right justified in the column, letters are printed left justified. So that's 1994.

Q. And of course the assumption there is

that Lakeview 3 and 4 are not rehabilitated?

A. That's right.

Q. And if you could turn briefly in the same exhibit to page D1-4. That is a similar LMSTM run?

A. That's correct.

Q. You see it's for the upper load growth case?

A. Yes.

Q. And you see that Lakeview Units 3 and 4 are retired in - I guess if these are left justified that would be 2005?

A. That's right.

Q. And I assume that if these units are retired in 2005, they are rehabilitated in this scenario.

A. I don't believe so. They remain in the plan, in this case, as they are, and the life extension work or the improvements, the rehab work that's been done at Lakeview has focussed on Units 1, 2, 5 and 6.

What is happening with Lakeview Units 3 and 4 here are no different than what is happening with Lakeview Units 7 and 8. They are assumed to be available and they would be -- well, they are assumed

to be available in the plan, up to that time period.

Q. Available in their current status then?

A. That's right.

Q. And their current status is that they are in need of rehabilitation, so their availability to the system would be reduced?

A. Yes.

Q. Okay.

A. They would be there largely in a peaking role as well. So the degree to which their availability is reduced exposes the system to less risk and therefore the peaking role.

Q. Okay. While we are on it, Mr. Dalziel, you mentioned Units 1 and 2 are currently being rehabilitated. I notice they retire in 2002 and 2003 in the upper load forecast. And if you look on the next page, D1-5, in talking about energy production for the upper, it indicates that the existing fossil includes all existing fossil stations and that this energy source is at a maximum in the years 2002 and 2006. If that's the situation, why are you retiring Lakeview in 2002 and 2003?

THE CHAIRMAN: What was the reference on page D1-5, please?

MR. R. WATSON: It's paragraph 3-1, Mr. Chairman. If you are looking at the bullets it would be the third from the bottom, starting with Existing Fossil.

THE CHAIRMAN: Thank you.

MR. DALZIEL: The question is why are those units being retired?

MR. R. WATSON: Q. Yes. You mentioned that had Lakeview 1 and 2 are being rehabilitated right now, and I just noticed on the opposite page that -- and this is an upper load forecast, I assume you need a lot of energy. That seems to be indicated on the next page where they say existing fossil includes all existing fossil stations, and it goes on to say this energy source is at a maximum in the years 2002 to 2006.

I am just curious why you are retiring Lakeview 1 and 2 in that scenario.

MR. DALZIEL: A. I would have to check but I believe that's consistent with the 40-year life of Lakeview units, so we are showing two units of the Lakeview station being retired.

Q. No, you are not showing two units, you are showing Lakeview 1 and Lakeview 2.

A. They are indicated that way in the

spreadsheet, I agree.

Q. But Lakeview 3 and 4 which aren't being rehabilitated are on in the upper for another two years and 7 and 8 are on for another five or six years.

A. I would have to check whether indicating Lakeview's 1 and 2 here carry a great deal of significance as to whether it's the more -- the capacity is being retired as opposed to the significance of the unit designation as shown here on the spreadsheet.

Q. Just to help you with in, Mr. Dalziel, I followed along in that retirement column and the retirement for Bruce is Bruce 2, Bruce 1 and then Bruce 3. It seems to indicate that there is some significance to the unit number.

A. Well, the retiring of Bruce Unit 2 is that -- before Bruce's Units 1 and 3 is that Bruce Unit 2 actually came into service ahead of Bruce Units 1 and 3.

[3:16 p.m.]

Q. But the point is it seems to indicate that is a unit designation as opposed to just --

A. Oh, there is no doubt, it is a unit designation. But whether it really carries any significance in terms of the energy production

simulation, that is what I am referring to.

Q. Okay. Perhaps you could let us know?

A. Yes, I will.

Q. Thank you. While we are on this LMSTM modelling just a quick question about modelling DSM.

You were talking this morning with Mr. Mark, and there was a discrepancy between targets and forecasts, and, Mr. Shalaby, you indicated it was about 400 megawatts right now.

When Hydro models DSM on the LMSTM do they use targets or forecasts? I assume they use forecasts, do they?

MR. SHALABY: A. You are right, forecasts.

Q. And also when they are looking at their need dates for planning they use forecasts, do they?

A. Yes.

Q. Could you help us with which forecasts were used for the current analysis of need date, which DSM forecast?

A. They are the ones documented in Exhibit 467, and in 452B and C there are figures on the demand management plan. I think these were subject to

discussion this morning on whether they are correct or not, that table on Exhibit 452, either B or C.

Q. Yes.

A. Figure 4-12, an Update to figure 4-12. But that should be straight out of Exhibit 467.

Q. And when you check those figures for us whatever those figures turn out to be those are the ones used in the model?

A. Yes.

Q. Thank you.

A. You can see them as well in the LMSTM input, the data on top of the page that you were referring to. It shows conservation and load shifting and so on.

Q. That was one of the reasons for the question, Mr. Shalaby, because we looked at those and the amount turned out to be just over 5,000 megawatts. I think it was 5,054 megawatts. It was neither 52 nor 48.

MR. DALZIEL: A. The values that are shown on the spreadsheet, for example, page C1-3 of Exhibit 646--

Q. Yes?

A. --those values are taken out of the load forecast, Exhibit 467, and they are based, in the

spreadsheet here, on December of the preceding year's values, and the reason for that is noted in another page in Exhibit 452, C or D, and I'll check it...

Q. If I just look at the numbers on the spreadsheet for the year 2000, Mr. Dalziel, and under Cumulative Demand Management --

MR. SHALABY: A. I think he's suggesting look under the year 2001. The target is for sort of December of the year 2000, which would be January, 2001. That would be the appropriate column to look under.

MR. DALZIEL: A. If you want, we will look at a specific year. We will look at the year 2000.

Starting with page C1-3 of Exhibit 646 if we look at the year 2000, and we will use the load shifting value, and you will see that in that page for the year 2000 it is 673 megawatts?

Q. Yes.

A. Okay? Now, I am turning to Exhibit 467, and while these pages aren't numbered I am looking in Appendix 1 - oh, yes, they are numbered - and it is page A5, and if we look for the year 1999, which is on the top half of page A5, on the far left-hand side are the column descriptors.

If we come down close to the middle, just before the middle, there is a "TOU MW". That is "time-of-use megawatts". That corresponds to load shifting.

If we run across to December, which is the second last column, we will find the megawatts associated with load shifting that were input to the spreadsheet for January of the following year, and the reason why the December values are picked up is -- I am told that they are using the December values because the load shape information that goes into LMSTM is based on December.

Now, if we were to check then the other values, I think if you were to -- the reason I picked load shifting is it is a direct value.

If we were to add then EEI megawatts - that is the electrical efficiency improvements - plus the FS megawatts - that is the fuel switching - over the December column for 1999, we will see that we total to 3,107 megawatts, and I would expect to find that value for the year 2000 under the descriptor Conservation, back in table C1-3.

Does it work?

MS. HOWES: A. Yes. Of course it does.

THE CHAIRMAN: Now, where, Mr. Shalaby,

in this table A1 is the 4,800 or thereabouts demand management target, or forecast?

MR. SHALABY: It is under the year 2001.

THE CHAIRMAN: Yes?

MR. SHALABY: And if we add the numbers -- if we go from the top the first number is 3,400. That is conservation.

THE CHAIRMAN: Yes?

MR. SHALABY: The next number to that is 750. That is the load shifting.

THE CHAIRMAN: And that adds up to 4,150?

MR. SHALABY: Yes. And then there is interruptible load. That is 578, which is a few numbers down from there.

THE CHAIRMAN: So you have to be careful. These numbers, some of them are additions of other numbers; is that right?

MR. SHALABY: I beg your pardon?

THE CHAIRMAN: Some of them are additions of other numbers? I mean, the 4,150 is an addition of 3,400 and 750?

MR. SHALABY: Yes, the cumulative demand management is the addition of the two numbers, yes. We are not adding to that anything that was part of it before, so...

MR. DALZIEL: The appropriate value to use for the interruptible or the DDS value, demand discount service, would be the December value which are not input into this table. The January values are input, but the December values are found in Exhibit 452B, and I am looking at page 5 for that example, and the number there is 615.

So if you were to add the 615 to the values that Mr. Shalaby just described you will come up with 4,865 megawatts.

MR. R. WATSON: Q. Mr. Dalziel, I have no doubt that what you are saying is correct. I must confess I didn't really follow all of what you just said.

We will review the transcript and if we have further concerns we will come back and talk to you about these.

The real point was we just wanted to make sure that you were using the forecasts in your model runs and which forecasts they were. Thank you.

At the risk of asking one more question about this, Mr. Shalaby, we do have one more concern. In the LMSTM runs you produced for us, they are Exhibit 10.7.12.

THE CHAIRMAN: Should that be given a

number?

THE REGISTRAR: That is .13.

---EXHIBIT NO. 683.13: Interrogatory No. 10.7.12.

MR. R. WATSON: Q. If you refer to case H2, Managed Surplus and IGCC, and it is quite near the end of your interrogatory response, your LMSTM runs. Those were the ones produced in March of '92. This is the output file, and it is page 1 of the output file near the back.

MS. PATTERSON: Where are we, again?

MR. R. WATSON: I don't believe you have it, Ms. Patterson.

THE CHAIRMAN: I take it this is some information you want to feed your experts?

MR. R. WATSON: I have been told to ask this question, Mr. Chairman.

THE CHAIRMAN: I wonder if you could do that on the break because obviously it is going to go right over our heads. We won't know what you are talking about.

MR. R. WATSON: I would be pleased to do that at the break.

I will talk to you at the break, Mr. Dalziel, with Mrs. Formusa. Thank you.

THE CHAIRMAN: We will take a break for a

few minutes.

THE REGISTRAR: Please come to order. This hearing will recess for 15 minutes.

---Recess at 3:29 p.m.

---On resuming at 3:48 p.m.

THE REGISTRAR: Please come to order. This hearing is again in session. Please be seated.

MR. R. WATSON: Q. I would like to turn now to another topic.

In Exhibit 646 on page 5 - that is page 21 of my exhibit - you notice the third bullet starting with the words "Consideration of CANDU 6..."? I would like to refer you to the second sentence in that paragraph. It reads:

> While CANDU 6 costs are higher CANDU 6 technology provides increased flexibility due to shorter lead times and the capability of commitment in smaller increments.

If you look at the next page of my exhibit - that is page 22 - and keep in mind that paragraph we just looked at, we have page B7 of Exhibit 646 which gives the levelized costs of various options.

At the very bottom of the page are the nuclear costs. You will notice the comparison between

the two CANDU technologies is 3.6 cents for the Darlington-type unit and the CANDU 6 technology is 4 cents.

My first question, Panel, is: Was there any analysis done to compare the flexibility to the cost to support your use of CANDU 6 in the plan, or was that simply a judgment call?

MR. DALZIEL: A. I think on your page 21 the -- referring to Exhibit 646, what is said there are simply two observations made on the characteristic of CANDU 6 compared to the 4 by 881, and it is simply observing, as you pointed out, that the LUEC for the CANDU 6 is higher than the LUEC for the 4 by 881. So that is why we have said the CANDU 6 costs are higher.

And I don't have the information in front of me, but I know it is in the Panel 9, Exhibit 519 package of overheads. They showed the lead times of the different CANDU options, and the lead time for the CANDU 6 is shorter than the lead time for the 4 by 881.

So what is said there is simply reflecting those characteristics of those two options.

Q. I have no difficulty with that, Mr. Dalziel. My question was: Have you done any analysis to quantify the benefits of the flexibility?

A. Not that I am aware of.

Q. Okay. And I notice you are checking with your panel members.

A. No.

Q. Okay. You use the CANDU 6 option over the Darlington-type option in the Update?

A. Yes.

Q. So your use of that was based on a judgment as opposed to some sort of analysis?

A. Having reviewed the characteristics of a number of nuclear options we chose to use the characteristics of CANDU 6 in the updated cases.

Q. Now --

MR. SNELSON: A. Now, Mr. Dalziel did indicate in his direct evidence that one of the planning questions addressed early in the process of developing the Update was the question of a more flexible CANDU option than 4 by 881. And so there was analysis done. It didn't necessarily, though, quantify the flexibility benefits of those options, but it did enable us to capture the other characteristics of those options.

Q. Certainly. But I was just dealing with the flexibility characteristics or the flexibility benefits, Mr. Snelson.

If we are looking at the costs associated

with those flexibility benefits, isn't it possible that because it is a judgement call that it is the other way around, that perhaps the flexibility benefits are not as great as you think they are and maybe the costs outweigh those flexibility benefits? And if that is so, then your use of CANDU 6 in the Update overstates the cost of the nuclear option; isn't that fair?

A. I think we have indicated that the CANDU 6 was used as illustrative of a smaller and more flexible nuclear option.

It is quite possible that when decisions have to be made then the options chosen may be different to the CANDU 6 and the costs could be higher or lower than we have indicated.

Q. And if it turns out you are using a Darlington-type unit the cost would be lower, and that would make the comparison more favourable with respect to nuclear?

A. If it is a Darlington-type unit and it works as planned, yes.

Q. Just using the costs that you provide in Exhibit 646?

A. Yes.

Q. Just looking at your overall planning strategy, if in fact you put in another option instead

of the one you used, for instance if you used a Darlington-type unit instead of a CANDU-type unit and redid your analysis, isn't it possible that you would get a different plan? You would perhaps have different options or a different ordering of options?

A. In this time period, which is when major supply is required, then we are acknowledging that there is a wide open range of options that are available to be chosen, and we have looked at nuclear and fossil as two options that might fill that need, but there could be others.

And they would affect the plan after that period; they wouldn't necessarily affect the plan before that period.

Q. Now, Panel, if I could refer you to your Update nuclear managed surplus case. That is in section C1 of Exhibit 646.

That is a median load forecast case, and Mr. Shalaby or Mr. Snelson, isn't it fair to say that within the constraints of this case you tried to optimize that case?

[4:00 p.m.]

MR. SHALABY: A. I think it is more illustrative than optimize. Optimize involves many, many refinements until we settle down somewhere, and I

don't think that was the case here.

Q. So there wasn't any attempt to optimize the cases that were in 746?

A. We knew we were heading towards a low cost case and it illustrates the features of such a case.

Maybe Mr. Dalziel can add to that.

MR. DALZIEL: A. I am not sure what you are referring to by optimization. Do you mean did the planners that were working on this case and actually putting in the options in the years that they were putting them in, did they move some of these facilities around and test out whether more peaking facilities should be included or whether more base load should have been included?

There was some work but it's a matter of degree as to exactly how far they carried that, and whether they optimized it to the absolute lowest cost. I don't think they have gone that far. But they have certainly brought it to the stage where they are satisfied that it's pretty close.

Q. To put it another way, Mr. Dalziel, is it fair to say that these plants weren't optimized to the same extent that the plants in the DSP were?

MR. SHALABY: A. I don't think there is

a big, clear distinction there. I wouldn't draw a big distinction.

THE CHAIRMAN: You wouldn't draw a big distinction or any distinction?

MR. SHALABY: No distinction. Similar degree of fine tuning and optimization, I would think.

MR. R. WATSON: Q. So they are similarly optimized?

MR. SHALABY: A. Yes.

Q. The update plans in 646 and the DSP plans that were presented to this Board?

A. Yes.

MR. DALZIEL: A. I would agree with that.

Q. If I could refer to you page 23 of Exhibit 686, and that's page E2-11 of 646. That's table D1 which compares the update nuclear managed surplus case that we were just discussing with the no-approvals case. And my concern is with respect to the bottom right-hand corner, the fact that there is a negative difference between these two plans. My simple question is, it seems to me that if there is a negative difference between these plans, if in fact the no-approvals case is less expensive, then that is one indication of a non-optimization of your update nuclear

case; isn't that fair?

A. In the update nuclear when we were asking about optimization, I assume you are referring to the optimization of the major supply component, and those are the facilities that are shown coming into service after the year 2010. As I said, it's a matter of degree as to how far you go in optimizing that, there is a fair amount of effort and work in doing that.

The fact that there is a lower cost or a cost difference between the no approvals in the Update, I wouldn't expect them to be exactly the same. But the fact that they are different is not due to the optimization of the supply facilities, the CANDU 6s and the combustion turbine units, as it is that you are replacing the capacity and energy of the Manitoba Purchase and the capacity and the energy of the hydraulic options.

Q. Mr. Dalziel, the concern is not that the costs are different, but that the cost difference is negative, the fact that the no-approvals case costs less. You just referred to major supply, I mean, in the no-approvals case you are talking removing the hydroelectric plan and the Manitoba Purchase, that's somewhere between 2,400 and 2,800 megawatts. That's

roughly about 10 per cent of your system. That is a significant change.

A. Yes.

Q. And my question is: With this negative difference between them, isn't that an indication that either your original update nuclear plan is not optimized or perhaps your no-approvals case is more optimized?

MR. SNELSON: A. The initial question with respect to the -- well, I think the basic answer to your question is that within the scale of things that we are dealing with, these two plans are approximately equal in cost.

We are dealing with tens of billions of dollars and we have a difference in the order of $100 million. These are the sorts of differences that are in this scale of things judged to be approximately equal.

Q. Panel, if I could turn to the question of the surplus, please. I would like to deal with the DSM forecasts and the options that are included in those forecasts. I assume that the options in those forecasts were tested for cost-effectiveness on a life cycle basis; is that fair?

MR. SHALABY: A. That was the evidence

of Panel 4, yes.

Q. And as I understand it, there is no analysis of whether the cost-effectiveness of these options could be changed or improved by changing their timing?

A. Many of the options are tested for cost-effectiveness in the period starting 2001, the demand management options.

Q. Yes.

A. The question is?

Q. My question is whether there is any analysis with respect to whether the cost-effectiveness of these could be improved by changing the timing of them?

A. Again, in what context, the timing, is this in a program sense or the evaluation of the options?

Q. In the implementation sense. If you are implementing a program in 1995, is there any analysis to say whether this program is cost-effectiveness would be improved if it was implemented say in the year 2000?

A. I am not aware of analysis beyond when programs get formulated and implemented, the analysis of whether implementing it now or in the near

future is justifiable. I think the question of implementing them several years in the future is not always asked.

Q. Isn't it possible that some of these DSM programs are not cost-effective in the early years?

A. It is possible.

Q. And if that's the case, then don't we have a situation where the early years of these programs are in effect subsidized by the later years of these programs?

A. If they were more effective in the latter years than the early years then -- I would rather see it as to get the program going you need sustained continuous effort, rather than one part of the program being subsidized by others. To get products developed and channels in the marketplace available to Hydro.

Q. But dealing with a specific program, Mr. Shalaby, if it's true that some DSM programs aren't cost-effective in their early years, then don't we have a situation where the cost-effectiveness of that program could be improved by deferring it a couple of years?

A. Again, without having a program in mind, it's difficult to answer concretely, but I guess

there could be situations like that, yes.

Q. I would suggest to you the same logic applies with respect to NUG programs.

A. The more the resources are matched to requirements, the more cost-effective they become, yes.

Q. Yes. And in looking at these programs that may not be cost-effective in the early years, if you have a situation where you defer the implementation and only implemented the cost-effective programs, you could reduce the amount of NUGs and DSM and that would go some way to reducing the surplus; wouldn't it?

MR. SNELSON: A. We are approaching the NUGs from that point of view, and you will have no doubt noticed that there are documents in evidence indicating that we have cut back on our NUG program because of lesser benefits in the mid-1990s.

Q. You still have NUG contracts that have front-end loading in them, for instance, don't you, Mr. Snelson?

A. I am not familiar whether the NUG contracts have front-end loading or not.

Q. Well, Mr. Snelson, I believe you were here on Panel 5, were you not, when we heard evidence about the various different financial incentives that

are provided to NUGs. And certainly one of the financial incentives to NUGs is the front-end loading of the contracts; isn't that fair?

A. I was here during Panel 5 and I believe that Mr. Vyrostko was discussing that, and I believe he did indicate that there were certain financial incentives available, but I couldn't tell you as to what extent they are used and I couldn't add to his testimony in that regard.

Q. Mr. Snelson, to the extent that there is front-end loading of NUG contracts, then NUGs are going to fit into the scenario that I described and they are going to contribute to the surplus, when in fact if the cost-effective years of those NUG programs were used, it would go some towards reducing the surplus; is that fair?

A. I think the situation is more with regard to the timing of NUGs than it is to the financial arrangements. If we take on additional NUGs in 1995 that contribute to surplus, then clearly the surplus will be less if we took on fewer NUGs.

And because of the way in which avoided costs increase as we start to see a real need for new generation , then the avoided cost of a NUG and the incentive to bring one on is more at a later date when

we actually need it than at a time when it's contributing to surplus.

Q. That's exactly my point, Mr. Snelson, we are talking about timing. As Mr. Shalaby has indicated, the timing with respect to NUGs and DSM is of significance, and if there are programs that aren't cost-effective in the earlier years, it can result in a situation where we would have further NUGs and DSM than we otherwise would have contributing more to the surplus.

A. I believe Mr. Shalaby has agreed with that statement, yes.

Q. Now, in addition to this we not only have a timing situation but we also have a situation with respect to avoided cost where you are using project appraisal avoided costs which are higher and you are using the 10 per cent preference premium. Both of those are of going to contribute as well to this situation with respect to the surplus; aren't they?

A. They contribute to making more non-utility generation look financially attractive.

The actions we are taking to manage surplus with non-utility generation are with respect to non-utility generation that comes within avoided cost, so this is separate from avoided cost, the actions that

we have been taking.

Q. Yes. And I understand that. I was taking it one step further, Mr. Snelson. I was simply suggesting that your avoided cost figures include an amount for project appraisal avoided costs which are higher than your planning costs?

A. That is correct.

Q. They also include a 10 per cent preference premium which is added on top of that.

A. Only for certain technologies that qualify for the preference premium.

Q. For most of the DSM programs?

A. For most of the DSM programs, yes.

Q. And as a result of those increases in the avoided cost, you are getting more DSM and NUGs, and that's contributing further to the surplus?

A. It may be. These are our preferred options, and certainly the higher level of avoided cost does help to encourage a larger quantity.

Q. Mr. Snelson, staying on avoided costs for a minute. We know that the capacity component of your SICs in the years before the first major supply option is added are related to the cost of a CTU, you use a CTU as a proxy; is that fair?

Perhaps Mr. Shalaby will want to answer

this question.

MR. SHALABY: A. In the project appraisal costs that's correct.

Q. And you said project appraisal, it's both though, isn't it, Mr. Shalaby?

A. No, I think the planning values use a Lakeview mothballing/demothballing cost.

Q. So let's stay with project appraisal then.

You would agree with me that in every year in which the load meeting capability of the existing system is greater than the median value of the basic load forecast, you should have a zero value for the incremental cost of power?

A. No, I don't.

Q. If you were not using a CTU as a proxy, you would end up with a zero value for the incremental cost of power?

A. Well, the purpose of the project appraisal values is to indicate what Hydro would do if it didn't get the demand management and the non-utility generation. And what we are indicating here is if we didn't do those, we probably would be building combustion turbines. So to reflect the value of demand management and non-utility generation, we are

reflecting that value by saying we would have built combustion turbines or demothballed units if we have units in mothballs at the time.

Q. But the use of a CTU in that circumstance overstates the incremental cost of power; doesn't it?

A. In what way?

Q. Because your load meeting capability is greater than your forecast.

A. It wouldn't be if we didn't have demand management and NUGs.

Q. But you do and it does; isn't that fair?

A. We went through that in Panel 3, that it is a decision to reflect the value of these, what if we have didn't have them. So those values are applicable to or designed to reflect if we didn't have demand management and NUGs what would our costs be. Because the other side of that coin also provides a quandary for the demand management and NUGs. Now that you have them, they don't have much value to you because they provided the reliability. So the other side of that also has fallacies to it.

Q. I think we are having a miscommunication here, Mr. Shalaby. My question was

with respect to basic load for case. You have been talking primary load forecast; haven't you?

A. You were talking about load meeting capability rather than --

Q. I am talking about the load-meeting capability of the existing system being greater than the median basic load forecast, and if that's the situation, your six for power are overstated with their non-zero?

A. If there is a situation like that then they could be overstated for that one year or two years. But we indicate that the necessity to maintain a program in NUGs and demand management is to give a signal that would support the implementation of those options.

Q. I understand. Let's just work from that, Mr. Shalaby.

A. I don't know whether the load-meeting capability exceeds the basic load forecast. If you can guide me to what period of time that exists, I would appreciate it, because my memory would tell me that probably that doesn't occur over a very long period.

Q. 1992, 1993, 1994.

A. That's not very long.

Q. We can go through the figures.

A. No. Let's accept that, that it's for a very short period of time that we might have a surplus above the median, the basic load forecast.

Q. Let's just start with that, Mr. Shalaby. For those years you should have a zero incremental cost of power for project appraisal?

A. The area of what you should or shouldn't we indicated there is a large number of methods and philosophies to do with avoided cost. Our choice is to full credit for capacity.

Now, there are other people who give zero, other utilities do give zero when they are in surplus, I agree with that.

Q. And your project appraisal values which are found at page 24 of Exhibit 686, that's an extract from Exhibit 592, we see for 1993 and 1994 that you do give the full cost of power.

A. Yes.

THE CHAIRMAN: What were those pages again, please.

MR. R. WATSON: Page 24 of Exhibit 686.

THE CHAIRMAN: Thank you.

[4:18 p.m.]

MR. R. WATSON: Q. Now, Mr. Shalaby, to the extent that you are giving this full value to the

incremental cost of power which is based on your using the CTU as a proxy you are overstating the cost effectiveness of your DSM and NUG.

MR. SHALABY: A. Only if you accept that zero is a better value. I haven't accepted that.

Q. Okay. But certainly you have a situation where your load meeting capability is greater than your median basic load forecast. In that particular situation in those years you just don't need the power.

A. That is correct for those years, but you --

Q. And the incremental value --

A. You build that power for a long period of time.

You know, the point I am making is you don't go to a supermarket and buy the power in half an hour the day you need it; you work with allies, with non-utility generation, with demand management people for a long period of time. You can't turn it off one year and on the other year.

So this is a stability, a signal that would give the marketplace the desired incentive to get the demand management programs underway. You can't turn it on and off. And that surplus probably occurred

very recently.

MR. DALZIEL: A. Can I just make an observation here, is that I have just looked at our 20-minute peak, January peak basic load forecast, and compared it with the load meeting capability of the existing system for the years that you mentioned. I am looking at Exhibit 452B, and I am finding that the load meeting capability is less than the median basic load forecast, certainly for the years that you mentioned, '92, '93, '94.

Q. Well, Mr. Dalziel, you are looking at 452B; I am looking at 452A. That is on pages 26 and 27 of Exhibit 686.

If you look at page 27 - that is the load meeting capability of the existing system - you notice for 1992 it is 24,888 megawatts. If you look back at page 26, "1991 Update" column, the right column, in 1992 basic load forecast is 24.7 gigawatts, which is 24,700 megawatts.

So therefore, the load meeting capability is greater than the basic load forecast, isn't it.

A. I am trying to catch up with you. I should have interrupted you sooner. You are looking on page 27?

Q. Page 27 of my exhibit.

A. Yes?

Q. If you look at 1992, the load meeting capability?

A. Yes?

Q. It says 24,883?

A. Yes, it does there.

Q. And if you turn the page to page 26 --

THE CHAIRMAN: Can't you look at the figures on page 27?

MR. R. WATSON: No, Mr. Chairman.

THE CHAIRMAN: Why not?

MR. R. WATSON: Because those are primary figures, Mr. Chairman.

THE CHAIRMAN: All right.

MR. R. WATSON: And page 26 are the basic figures.

THE CHAIRMAN: All right.

MR. R. WATSON: Q. And if you look on page 26 for 1992 under the 1991 Update you see the figure is 24.7 for basic load forecast median?

MR. DALZIEL: A. That's correct.

Q. So therefore, the load meeting capability is greater than the basic load forecast?

A. I guess the difference is arising

between which column of numbers is correct, between Exhibit 452A and 452B, and I see that the column of numbers is different, and I guess that we would have to look into which column of numbers should be relied on.

Is that right?

Mr. Snelson is also pointing out, I guess, the reason why they are different -- I am referring to the load meeting capability of the existing system.

And the need date for new major supply figure that you have on page 27, the available supply load meeting capability is including -- already includes NUGs, so...

Maybe that doesn't change your point. I'm not sure.

Q. No, I think the point is the same. It is the load meeting capability versus the basic load forecast. If it is greater you don't have any value for your power; you don't need the power. You have a zero incremental cost of power.

But if the figures are different perhaps you could give us another errata.

A. Well, I don't want to do that.

Q. Well, no, I am quite interested in it, as a matter of fact, Mr. Dalziel. You are now

telling me that the comparison I am making is wrong because there is another set of figures in 452B that are different. I would like you to tell me, to go back and analyse this and tell me which are right, the (a) figures or the (b) figures.

A. Well, they are both right.

The point I am trying to bring to your attention, and I may not have appreciated when I stepped in here, is that I thought that you were comparing the load meeting capability of the existing generating system, Hydro's existing load meeting capability, and I guess what you are looking at is the load meeting capability, including the other options that we have; namely, the purchase NUGs.

Q. All right.

A. So on the basis of Hydro's load meeting capability with the existing system as we have it, that load meeting capability is less than the median basic.

But I would agree that if you take into account the purchase NUGs then the load meeting capability is higher than the basic median load forecast, which is what you said earlier.

Q. Mr. Dalziel, what about your statement that there is a difference between the

figures on 452B and 452A? Is there a difference?

A. Yes, there is a difference. I thought I just explained.

THE CHAIRMAN: You may have explained it, but I didn't understand it. Tell me what the figures on 452A are and what the figures on 452B are.

MR. DALZIEL: The figures in 452A can be compared to what we called earlier in our direct evidence the 'projected load meeting capability of the existing system', including the Manitoba Purchase, the hydraulic option--

THE CHAIRMAN: Okay.

MR. DALZIEL: --and the purchase NUGs.

THE CHAIRMAN: Right. And 452B does not include those three things?

MR. DALZIEL: That's correct.

THE CHAIRMAN: Okay.

MR. R. WATSON: Q. So there is no contradiction in the figures?

MR. DALZIEL: A. Not that I am aware of.

Q. Just to finish off this point, Mr. Shalaby, we are talking about theoretically looking at when the value for the incremental cost of power is zero. The theory is if you already have lots of surplus, then you don't have a value for the cost of

power, you don't need the extra capacity. Isn't that generally the theory?

MR. SHALABY: A. That is an interpretation that has been accepted by various regulatory agencies. There are utilities in states in the United States that accepted that argument, that when a utility is in surplus they pay zero for power.

The purpose for which we designed the project appraisal values is to increase the chances of obtaining our targets. So the purpose for which these were designed is to encourage industries, to give a signal for development, is to have options for the long term.

And that purpose is not a purpose that can be pushed down one year and pushed up the other year very significantly. You would work against the purpose for those values.

Q. Now, Mr. Shalaby, we were comparing the load meeting capability versus the basic load forecast.

Now, you indicated this morning that a number of the NUGs were already in service or committed or were well on the way to renegotiation.

Now, we could also extend this analysis and look at the NUGs that are committed and add them to

in effect the load meeting capability of the system and compare that to the basic load forecast?

A. From what I understood Mr. Dalziel to be saying, I think that is what you are doing. You are comparing - and correct me if I am wrong. You are comparing the Hydro capability plus the non-utility generation to the basic load forecast.

Am I right?

Q. So the same analysis applies; correct?

A. That is the only analysis we have done so far, I understand, here.

Q. And we could take it one step further. We could add, if you will, the committed DSM programs to that as well, couldn't we, and compare --

A. I think that is reflected in the basic load forecast.

Q. In the 'primary' load forecast?

A. 'Basic'. I think the previous -- I got to check that, whether the previous achievements in demand management are incorporated in the basic or not. Do you know about that?

Q. We are not talking about previous, Mr. Shalaby. We are talking about the ones that are committed, the ones that you anticipate.

A. Oh, I see what you mean.

MR. SNELSON: A. I think to help clarify --

Q. You see the difference?

MR. SHALABY: A. I see the difference.

Q. If you simply add the DSM programs in the same way that NUGs programs are in--

A. Yes.

Q. --and compare that to the basic load forecasts.

A. I accept that, yes.

Q. And then the same argument would be made with respect to whether the cost of power should be zero?

A. Yes.

Q. Okay.

MR. SNELSON: A. The point I would like just to make here, Mr. Watson, is that the base for the project appraisal of avoided costs includes the committed non-utility generation and committed demand management programs or actual demand management program savings, but the concept is those that are committed because there is very little future commitment in the demand management programs.

But the committed non-utility generators

are in the base that is evaluated for the project appraisal costs.

Q. Thank you, Mr. Snelson. Just one question before we leave this. We have been talking about project appraisal, but all of this applies to planning values as well, does it not?

MR. SHALABY: A. The value of power in planning values, as we indicated, is less than combustion turbines.

Q. Correct. But the same analysis still applies, looking at the load meeting capability versus the basic load forecast? And, as you indicated, certain utilities accept the proposition that if that load meeting capability is greater there is zero cost, incremental cost of power?

A. All I am indicating is -- when you say the theory is or the correct answer is, I am just saying there are as many theories and as many answers as there are lawyers in this room.

There are not unique solutions to the question of what is the correct avoided cost or what is the correct methodology. People adopt methodologies to serve purposes that they want them to serve, and in our context we want to encourage demand management and non-utility generation, and for that reason we think

those values are appropriate.

Q. Mr. Shalaby, I have a question about modelling combined cycle units in LMSTM. In the DSP I understand that you modelled the combined cycle units as CTUs; is that fair?

A. In the 1989 DSP?

Q. Yes.

A. We modelled the...?

Q. Combined-cycle units as CTUs?

A. As being the first stage of the combined cycle units?

Q. Yes.

A. Yes.

Q. And you didn't model any conversion from the CTU phase to the combined-cycle phase?

A. That is correct.

Q. And is that what you are doing now in the Update as well? Is the methodology the same?

A. Mr. Dalziel tells me it is, yes.

Q. And to the extent that it is the same that tends to overstate the system incremental cost, doesn't it?

A. Not if they were operating at a low capacity factor. They are better left as CTUs if they are operating at a small capacity factor. If they

start operating at a high capacity factor, then conversion would become a better idea. So it really depends on --

Q. But you are planning on converting the CTUs in the Update to a combined cycle and then to IGCCs, are you not?

A. I thought your question was how were they modelled, rather than what the eventual plan for the facilities.

Q. That's correct. That is how they are modelled, but your plans are different from how they are modelled; isn't that fair?

A. The plan says: Implement the first stage --

Or at least the 1989 plan indicated: Implement the first stage of a combined-cycle plant that is capable of being converted. And then the modelling may or may not convert.

Maybe Mr. Dalziel can add what the 1992 DSP looks like.

MR. DALZIEL: A. I am a little unclear what you mean what our plans involve.

The update nuclear median load forecast uses a combination of CANDU for base load and CTUs for peak load. Those CTUs may be converted to CC or IGCC

operation, depending on, you know, where they are sited, for example.

They are modelled only as operating as CTUs. Does that answer your question?

Q. Well, Mr. Dalziel, just following up on what Mr. Shalaby was saying about capacity factors, the important question then is: What capacity factors are these CTUs operating at near the end of the planning period?

A. I am referring to Exhibit 646, page C1-4, and paragraph 3-1 on that page about the middle makes an observation about new fossil supply. It says:

> New fossil supply includes oil/gas CTUs. The first CTUs are in service in 2011. However, energy from new units never exceeds 700 gigawatthours at 2.8 per cent capacity factor.

Q. With respect to modelling DSM and NUGs in LMSTM, I understand that they are modelled as a constant in all of the major supply cases that were evaluated in the DSP; is that fair?

A. The demand management programs were a constant in all of the cases?

Q. Yes. In the DSP.

A. In the DSP, yes.

Q. Thank you. That is how they were modelled for LMSTM?

A. That's correct.

Q. Therefore, doesn't this give you a limited ability to capture the differences in the costs from changes in the DSM and NUG forecasts?

A. I don't understand the question.

Q. If they are modelled as a constant and there are changes to them, how does your model deal with that?

A. You mean, the modelling of the demand management costs essentially is done on a per megawatt basis. So if there is more megawatts in demand management in the model, then the costing will pick that up and it would be reflected in higher costs attributed to that component.

Q. So, Mr. Dalziel, is it your evidence that the modelling of the DSM costs properly account for changes in the forecast?

A. Yes.

Q. Panel, dealing with overall costs in a surplus situation, would you agree with me that a new resource that has a total LUEC which is less than the energy component of the system incremental cost will reduce total system costs?

MR. SHALABY: A. Did you mean to say it the other way? Say it again because that doesn't sit right.

Q. Let's assume a new resource. It has a total LUEC which is less than the energy component of the six, and it will reduce total costs.

A. That's correct. That's right.

Q. And that is even if it doesn't displace any capacity?

A. Yes.

Q. And that is also true even if the reserve margin is higher than the target research margin?

[4:40 p.m.]

A. Yes.

Q. Doesn't this indicate that in certain situations it may be possible to find cost-effective resource additions even when there is a capacity surplus?

A. Yes.

Q. And as I understand your evidence this morning, you haven't done any analysis to determine the cost-effectiveness of resources under surplus conditions?

A. Where did I lead you to, to that

belief?

Q. If I am wrong, Mr. Shalaby, tell me. If there is some analysis to determine the cost-effectiveness of these resources, I would like to know about them.

The simple question is, is there some analysis?

A. We have provided an undertaking to provide you the cost-effectiveness of demand management. We have shown you the cost-effectiveness of the hydroelectric program. Mr. Snelson has shown you the cost-effectiveness of the Manitoba Purchase in undertakings and in evidence. All of that constitutes evaluation of resources even under the surplus conditions.

Q. Is there any one analysis that brings this all together?

A. There is the undertaking on the Manitoba transmission that Mr. Snelson mentioned in direct evidence, and the undertaking on demand management I will be providing that we took today.

All of it in one place, not in detail. The only place would be in rough form, but not in detail.

Q. Panel, at Exhibit 646, page C1-2,

that's the managed surplus median load nuclear case, paragraph 2.2, it indicates that Little Jackfish is cancelled.

THE CHAIRMAN: What page?

MR. R. WATSON: Page C1-2 of Exhibit 646.

THE CHAIRMAN: Where are you reading from?

MR. R. WATSON: Paragraph 2.2, the last line.

THE CHAIRMAN: Yes, all right.

MR. R. WATSON: Q. It indicates that Little Jackfish is cancelled for the median load forecast. Can you help us as to why it was cancelled as opposed to postponed?

MR. SNELSON: A. This was one of the illustrative surplus management assumptions and as such it is an illustrative case, illustrative assumption rather than a decision on how we will manage the surplus.

I understand that the considerations that went into that were that Little Jackfish is one of the least economic if not the least economic of the hydroelectric projects according to the cost/benefit ratios that were available at the time that the surplus management, illustrative surplus management was being

decided upon. And that there has been some advice that if that project is stopped and shut down for a long period of time, then maybe we can't restart it. The reason for that is that it was started in the mid-1980s and shut down -- in the early 1980s and shut down in the mid-1980s, we got everybody in the area interested in the project, we were going through public meetings and so on, and then we cancelled because of lack of need. And now the project is going again, and if it was to be another off-again situation, then there have been views expressed in the organization that there would be difficulty in getting that project going again and convincing people that we were serious and that we weren't just playing around and wasting people's time.

Q. And that's the reason it's left in the upper load forecast scenario?

A. Yes, in the upper load forecast scenario we would continue and proceed, and having obtained the approvals we would implement them and build the plant.

Q. So, Mr. Snelson, you mentioned two reasons, one was economic and another was, shall we say, a social or non-economic reason.

Dealing with the first one, the economic reason, if you look at your evidence, your overheard

package, it's Exhibit 682, page 76, it shows the cost/benefit ratios of the hydraulic options. You will notice Little Jackfish is .94 and you indicated that was the least economic of all the options. I note that Patten Post is at .93. So the economics of Little Jackfish and Patten Post are pretty well similar; are they not?

A. That's certainly true with today's evaluation.

The actual evaluation that was in front of people at the time that illustrative surplus management was being put together was the set of cost/benefit ratios that were discussed by Panel 6, which was based on an earlier round of system incremental costs, and I believe that in that case the cost/benefit ratio of Little Jackfish was showing a number over one.

Q. So based on today's information that you have provided to this Board, the economics appear to be not as significant as your concern with respect to the on again/off again nature of Little Jackfish?

A. As I have said, the surplus management decision was illustrative, it wasn't intended to be definitive, and those were the sorts of factors that people had in mind.

Q. Panel, if you could turn to page 29 of Exhibit 686. That's page 28 from Exhibit 452. If you look at the second paragraph, starting with the words about 250 megawatts. The second sentence reads: The lead time for installation is expected to be about four years.

You are talking about the lead time for installing CTU capacity on existing fossil generation sites. When you use the word "installation", does that include both the definition and acquisition phase?

MR. DALZIEL: A. I think we have shown lead time for CTU options as being two to five years, and so the four years is within that time frame. The two-to-five-year range I think included, I would have to check with the lead time figure that's in Exhibit 3 in chapter 15, but it could include those components that you are referring to.

Q. I was referring to the definition and acquisition phase. Do I take your answer to be that this sentence, when it refers to installation, it is referring to both the definition and acquisition phase?

A. I believe so.

MR. SNELSON: A. Yes, Exhibit 3, page 15-6 indicates definition phase for combustion turbines of one to three years, acquisition phase of one to two

years and a total time two to five years. So four years is reasonably representative of the total of the definition phase and the acquisition phase.

Q. Mr. Snelson, if you could turn the page 30 of Exhibit 686. That's an excerpt from Exhibit 87, page 71. If you look at the second paragraph, it's talking about the lead time for combustion turbines to meet unexpected load growth. And it says:

> When Ontario Hydro and other utilities decide to place orders for combustion turbines to meet unexpected load growth, the lead time may be larger than three to four years.

Now, this is the 1991 reliability review. It goes on to use a four-year lead time for the purposes of setting the target reserve margin, and it is assuming that is an acquisition phase. And my simple question to you is, shouldn't you assume consistent lead times when you are looking at your reliability review and when you are looking at your response portfolio?

A. I am just checking Exhibit 87. You have said that Exhibit 87 assumes the four years to be acquisition time, can you tell me where in Exhibit 87 it says that?

Q. Well, Mr. Snelson, isn't that what it has to be? When you look at that paragraph, it's talking about placing orders for CTUs. You don't place orders until you are committing to a CTU, isn't that fair, and that happens in your acquisition phase? You are not going to order CTUs in your definition phase, are you?

A. We may do.

Q. I beg your pardon?

A. We may do.

In 1990 when we had a definition phase study going for CTUs, then there were proposals to order the CTUs during the definition phase with cancellation clauses so as to eliminate this problem of potential piling up in the manufacturer's backorder.

Q. Mr. Snelson, I was referring to your evidence back in Panel 2 or Hydro's evidence back in Panel 2. I believe Mr. Rodger was cross-examining the panel. I believe you were on Panel 2, were you not, Mr. Snelson?

A. Yes, I was.

Q. About the difference between concept phase, definition phase and acquisition phase. I believe it starts at page 3468. At that point the evidence was that orders are placed in the acquisition

phase. Has there been a change between then and now?

A. I also read some Panel 2 transcript today, and I don't have it with me, and I recall the discussion saying that orders were usually placed during the acquisition phase, but they could be placed during the definition phase with cancellation clauses.

Q. I read the transcripts too, Mr. Snelson. Wasn't that evidence to the effect, Mr. Rodger was trying to suggest to you that that is something that Hydro could do. You indicated that that was an option but that in fact Hydro was not prepared to do that.

A. I am afraid I don't recall that.

Q. Mr. Snelson, if you look at page 3478.

A. I am looking for my own reference at the moment, if you don't mind, for a minute.

Q. Mr. Snelson, I don't want to get into a battle of the transcripts with you.

My only point here is that to the extent that you place orders for CTUs in the acquisition phase, you have a situation where you have a discrepancy between your Exhibit 87, your analysis with respect to reliability, and your Exhibit 452 which is your conclusions with respect to your response

portfolio for the simple reason that you have left out the definition phase. Would you agree with me on that?

THE CHAIRMAN: I thought he said he didn't agree with you on that in the reading from Exhibit 87.

MR. WATSON: Mr. Chairman, I believe Mr. Snelson said in reading 87, if orders were placed in the definition phase, and I suggested to Mr. Snelson to the extent --

THE CHAIRMAN: Maybe we could through all this and just ask him questions about CTU lead times. It may be a little more helpful than going through all these documents.

MR. R. WATSON: Q. Mr. Snelson, my simple point is that my client is concerned that the lead times for CTUs that you are dealing with are not large enough. You are talking about a 4-year lead time in Exhibit 87. If that order is placed in the acquisition phase, then the definition phase has to be added on to that lead time; doesn't it?

MR. SNELSON: A. No.

Q. Is it there not a definition phase associated with a CTU?

A. Yes.

Q. And if the order is placed in the

acquisition phase, doesn't there have to be work done before the acquisition phase?

A. If the order is placed in the acquisition phase--

Q. Yes.

A. --then there has to be work done before the acquisition phase.

Q. That's right. And that's called the definition phase?

A. There has to be work done before the acquisition phase whether or not our order was placed in the acquisition phase.

Q. That's right. And that is called the definition phase, is it?

A. Yes.

Q. And that is part of the lead time; isn't it?

A. Yes.

Q. And if you are placing the orders in the acquisition phase and there is a 4-year lead time for that, then the definition phase has to be added to that?

A. If the orders are placed in the acquisition phase, but they don't need to be placed in the acquisition phase.

I refer you to page 3470 of the transcript where it says - and it is discussing placing of orders - the question is:

"Did you just say now that the orders can be placed in the acquisition stage?"

And my answer is:

It is not normal to place orders prior to commitment."

And commitment is defined as the start of acquisition phase.

"If any orders were placed prior to commitment, they would have to have cancellation clauses in case the commitment did not, in fact, happen."

And with respect to CTUs, then it is possible to either place orders during the definition phase with cancellation clauses, or to effectively pay a small amount of money to a manufacturer to guarantee a place in his line, and that can reduce the risks of long lead times due to build up of orders and not being able to place a firm order before the start of the acquisition phase.

Q. I think we understand all that, Mr. Snelson, and your evidence is it's not normal to do that.

A. It's not normal to do that, but if it was considered to be a serious enough risk then it could be done.

Q. And to the extent that the order was made in the acquisition phase, the lead time would be longer?

A. If the order was placed in the acquisition phase and the lead time was longer and the manufacturers had long orders books.

Q. Now, Mr. Snelson, looking at the use of a CTU, one of the uses that Hydro has for it is sudden changes in demand. It's supposed to be a flexible option that can respond.

A. Yes.

Q. And one of the reasons it may have to respond is with respect to low DSM targets?

A. With low DSM achievements.

Q. Low DSM achievements, indeed.

And you have no experience with how fast DSM programs can ramp up, do you, no significant experience?

A. We have limited experience in that regard.

Q. And also, all of your significant DSM programs are being implemented now; isn't that fair?

You are not holding any significant DSM programs in reserve in case there is a problem, are you?

MR. SHALABY: A. The programs have all been analyzed but not all of them are being implemented all at once.

[5:01 p.m.]

We don't have all the options being implemented immediately.

Q. So is your evidence that you are holding some DSM programs?

A. For example, fuel switching is not being implemented at this time.

Q. There are very specific reasons for that. But you are not making a policy decision to hold some DSM programs in reserve in case you don't meet your targets?

A. I think there are situations where they have backup programs in case the frontline programs do not achieve their targets.

Q. But these aren't your mainline programs. These aren't your major programs; these are, if you will, fallback programs?

A. The ones that are being held back?

Q. Yes.

THE CHAIRMAN: Shouldn't we be going back

to Panel 4 to get all this information?

MR. SHALABY: Yes.

THE CHAIRMAN: I mean the Panel 4 evidence. Isn't this all dealt with in Panel 4?

MR. R. WATSON: The significance of it here, Mr. Chairman, is looking at the planning philosophy. If there is a concern about CTU lead times, and if in fact there are no DSM programs in reserve, everything is being put forward now; we are facing a crunch with respect to the reserve, the response portfolio.

THE CHAIRMAN: Well, that may be, but these questions of these witnesses were dealt with in Panel 4.

MR. R. WATSON: Yes. I will finish the point, Mr. Chairman.

Q. My simple question to the panel then is: Knowing in your analysis in 646 that you are planning on having -- in some of the scenarios planning on having CTUs in service for 1996, shouldn't you be looking for approvals for these CTUs now?

MR. SNELSON: A. We don't believe so.

Q. And not having those approvals, I would suggest to you, is going to hamper your ability to respond to the upper load forecast.

A. About three points to make in response to that. First of all, we believe the upper load forecast is overstated in the early to mid-1990s. Secondly, if we need additional capacity in that period it may very well be that we would achieve it through additional non-utility generation.

And I guess the third point is that if those rather unlikely eventualities were to occur that we actually have a load that is as high as shown in that other scenario then we would have to go and get the CTU approvals at that time, and we appreciated that. But at the present point in time we see that upper load growth scenario in the mid-1990s as being very unlikely, and we know that we have large quantities of non-utility generation being offered to us for that period.

MR. R. WATSON: Mr. Chairman, perhaps we could break for the day.

THE CHAIRMAN: All right. We will break until tomorrow morning at 10:00 o'clock.

THE REGISTRAR: Please come to order. This hearing is adjourned until ten o'clock tomorrow morning.

---Whereupon the hearing was adjourned at 5:03 p.m. to be reconvened on Wednesday, May 27th, 1992 at 10:00 a.m.